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**JUNE, 1922**

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# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association*

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## ORIGINAL ARTICLES

### TRAUMATIC SURGERY AS VIEWED FROM AN INDUSTRIAL STANDPOINT\*

WILLIAM O'NEILL SHERMAN, M.D.  
Chief Surgeon, Carnegie Steel Company  
Pittsburgh, Pa.

Traumatic surgery, as applied to industry, covers a very broad field. Those of us who labor, whether it be on a farm, in a factory, or in an office, should be classified under the general heading of industry. Industrial surgery has been developed to a marked degree of specialization in recent years, keeping pace with the general industrial development. Working conditions which exposed the vast army of employed to certain hazards have been recognized by the progressive employer, and this has resulted in great constructive safety movements and highly developed medical and surgical organizations becoming a part of the personnel of modern industrialism.

The thoughtful employer is cognizant of the fact that conservation of the human machine is of the greatest importance. The medical profession, to a great extent, never has participated in the general plan of industrial organization. Employers today charge the industrial surgeon with keeping to a minimum the disability hours which, when translated into earning power, cause an immense loss of wages to the bread-winner. Surgical infection in industry produces more loss of man-power than the entire catalogue of so-called industrial diseases. Too often, the industrial surgeon has been considered a necessary evil and consulted only in extreme emergency. Industry now recognizes the great need and benefits, both commercial and humanitarian, of a well organized medical department. The sanitary problems in industry are solved by the application of preventive medicine, and the employer now demands standardized preventive surgery for increased production.

It is a sad commentary upon our profession, however, when we contemplate the great dearth of medical men who have executive ability, broad

vision and fearless mind, so necessary to a grasp of this great problem of industry.

Approximately 52,000 United States participants were killed in the late war. During the same period, 125,000 persons were killed by accidents in the United States. There were two million accidents in which the disability extended over a period of one month or more, with probably ten million of less than one month or of no disability. These statistics are startling, but nevertheless true.

#### LESSONS DERIVED FROM THE WAR

Some members of the profession maintain that nothing new or constructive was learned from the war; others hold that much was developed that is applicable to civil practice. Opponents of new methods and their practical adoption may well charge themselves, and justly too, with at least partial responsibility for the lives of many who now lie on Flanders field and the western front, as well as for many of the thousands of cripples whose disabilities would have been materially lessened had they received the treatment that modern science affords. The destructive critics and obstructionists who stand in the path of progress will have much to answer for. Frequently the most flagrant offenders are the so-called leaders, who are so self-satisfied that they will not comprehend that which is contrary to or different from their own pet theories or past practices. They have closed minds. As a result of this stubborn and tenacious position, the profession in general is not prone to accept ideas or methods which may be contrary to the teachings as handed down by its leaders. Theories are so deeply imbedded in their souls and minds that they are oblivious to facts and results which should convince even the most hypercritical. As a result of this reluctance of the profession to accept new methods, we fail to utilize many great scientific advances until years after their first discovery. The acceptance of antisepsis, vaccines, anesthesia, germ life, etc., all met with vicious opposition.

So it is with the medical discoveries of the war. Carrel's great contribution on wound treatment was given little consideration or credence when first presented. In the minds of these so-called

\*Presented before the Southern Minnesota Medical Association, Mankato, December, 1921.

leaders, it simply could not be true because it had not been done that way before. While the Carrel treatment was being discussed, many unnecessary sacrifices of life were made. The basic principle of general excision of wounds and devitalized tracts could not be generally carried out at the front because of the lack of casualty clearing stations, transportation, etc. The primary mechanical and then chemical sterilization of wounds, followed by secondary closure, was performed in only three hospitals in France, England and Belgium in November, 1916, many months after Carrel's paper was presented before the Academy of Medicine in Paris.

Time will not permit the relating of the train of events from that time until the end of the war, other than to state that the principles suggested were very reluctantly accepted. Carrel and Dakin succeeded in perfecting a technique of making sodium hypochlorite solution of definite strength and with a minimum of caustic (alkaline) action by adding bicarbonate of soda. In this way it differed materially from Javel water, Labaroque's solution, Eusol, etc. The difficulties with Dakin's solution, as made from bleaching lime, with its well known uncertain volatile chlorine content, decidedly prevented its general acceptance. Its transient stability and laborious titration, together with ever-present caustic alkalies, frequently resulted in defeating its well-merited principles.

There has been perfected by a special electro-chemic process a standardized, concentrated solution of sodium hypochlorite which is isotonic in dilution, free from caustic alkalies, having a special alkalinity. This concentrate is stable and uniform. It is remarkably solvent to bacteria and organic debris and leaves the living tissues intact. This concentrate contains sufficient sodium chloride so that by proper dilution an isotonic (1 part concentrate, 9 parts water) hypertonic, or hypotonic solution can be instantly made. Sir Almoult Wright has laid great stress on hypertonic saline solution on account of its increased osmotic action as well as increase in drainage. A Dakin solution made from this concentrate is decidedly less irritating and non-destructive to all metabolism. It is the first solvent antiseptic ever placed before the profession that will destroy all bacteria with which it comes in contact, as well as dissolve organic debris (proteins, albumen, etc.) and at the same time leave the living tissues intact. It literally burns up the bacteria and proteins without any

caustic or destructive action on the living tissues. If intelligently used, it will destroy, by direct contact, bacteria regardless of their location. This is a tremendous step in advance, as heretofore most antiseptics caused more harm than benefit by their coagulation of proteins.

The profession has been extremely backward in accepting this preparation, which has been approved by the Council on Pharmacy and Chemicals of the A. M. A. We have now arrived at the stage where we can say definitely that infection should rarely occur in wounds. I am speaking of wounds of trauma, and not operative wounds. In view of past experience, we cannot expect these statements to be accepted by the profession for many years. The lay public, however, is fast learning of medical progress and the time is near at hand when we are going to be censured for our errors of omission and commission.

#### THOMAS SPLINTS

The Thomas splint was devised by Hugh Thomas approximately fifty years ago, but the profession would have none of it, so it was not until the late war that its merits were recognized. Every hospital, ambulance, and first aid hospital should be equipped with these splints. At present, they are only occasionally used. The Balkan frame is also most indispensable in the treatment of fractures and traumatisms. They should also be part of the general hospital equipment.

#### MOBILIZATION OF FRACTURES, DISLOCATIONS, SPRAINS, ETC.

Notwithstanding Champonaire's appeal of 25 years ago in which he clearly pointed out the advantage of early mobilization, the profession never accepted his doctrine. The terrible permanent crippling results of the early part of the war drove us in sheer desperation to other methods. Now, all unite—except those who have had no experience or are lacking in knowledge of the physiology, anatomy and mechanics of the body—in inaugurating at the earliest possible date the mobilization of traumas. Confined rest and immobilization have done more harm than they have ever done good.

#### EXTENSIVE COMPOUND COMPLICATED FRACTURES

The prevention of infection is extremely difficult in this type of case. We are now able by doing a complete débridement, securing a correction of the deformity and a fixation with plate and screws (the wounds being left wide open), and following with the Carrel method of sterilization, to save



many cases from amputation, conserve function and say definitely that there is practically no danger from infection if the blood supply is sufficient.

At the end of from four to six weeks, plates and screws are removed (as they have served their purpose) and the wound is allowed to close by granulation or secondary suture. We have been told almost universally that this should not and could not be done. The use of steel plates, screws, etc., in the early part of the war was most disastrous, and was practically forbidden in the British army. At that time they had not learned how to either mechanically or chemically sterilize wounds and their casualty clearing stations and transportation facilities were such as to make the practice productive of frightful end results.

In civil practice, one can usually do a débridement within the first few hours, at the same time keeping the patient under observation and treatment. In the extensive comminutions plates are not indicated and are likely to cause annoyance. They are of great value in holding fractures in perfect end-to-end alignment and cause no trouble other than staining of tissues due to oxidation and possible superficial necrosis of the bone.

#### BONE GRAFTING

In civil and industrial practice, bone grafting is usually indicated when there is a great loss of substance and in certain pseudo-arthritis. Many of these operations are the result of improper correction and alignment, which could be easily obviated if the malpositions were corrected early. When the profession and public realize that much of the so-called setting of fractures by the closed method is quite impossible and that proper early corrective operations offer the best possible end results with good function, then only shall we eliminate much reconstructive and orthopedic surgery which is to a great extent due to confusion of methods and faulty practice. When fractures are anatomically reduced, the indications for bone grafting will be rather rare.

#### TWO-STAGE OPERATION FOR AMPUTATIONS

Amputations following trauma were frequently followed by profuse infection and sometimes gangrene. It must be remembered that the trauma incident to these extensive injuries frequently devitalize the tissues and that sloughing and infection is most common despite all attempts at asepsis. It has been our practice in cases of shock and hemorrhage (where the shock is not too profound) to

perform a modified guillotine operation, leaving the skin flaps sufficiently long so as to permit of secondary closures without further re-amputations.

The Carrel technique with sodium hypochlorite from .5 to 1 per cent keeps the wound perfectly aseptic and permits of secondary plastic operation, which, in many cases, has conserved knee joints, as well as life.

In a large series of cases during the past six years, we have had but one failure and that was not due to the method. We have materially reduced our mortality, convalescence, etc., as well as preventing many extensive and unnecessary higher amputations. Secondary closure following chemical sterilization of the amputations has been uniformly successful. This procedure has simplified the treatment of extensive crushes, and one can definitely state that infection will not take place if the details of the technique are followed. The attempts to modify and constantly change basic principles is the chief cause of failure and poor results. The failures are due to personal lack of understanding and not to the method.

#### SKIN GRAFTING

Previous to the chemical sterilization of wounds, approximately 50 per cent of our skin grafts were failures. This was due to our grafting on granulating tissue which appeared clean to the naked eye, but on culture or smear proved to be infected. During the past five years, we have followed this technique with the result that in approximately 1,500 grafts, 98 per cent have been successful.

Granulating wounds are chemically sterilized (an average of one bacterium to four fields); the area is then well covered with grafts (Tiersch or Wolf) and protected with a basket-weave dressing, using small strips one-eighth to one-fourth inch wide of perforated Cello-silk, which is transparent, covering this with a loose pad of gauze into which Carrel tubes properly perforated are incorporated.

The wound is injected every two hours with 1-200 sodium hypochlorite. Dressings are changed every four days; the same technique (with dressing as first applied) is continued until healing is complete, which usually occurs in ten days; all dressings can then be discarded or just dry dressings used.

Failures in skin grafting are due almost entirely to the attempt to graft on infected granulations and the failure to keep the wound aseptic, or relatively so, following operation. The end results of

this operation are in direct ratio to the thoroughness with which the details of technique are carried out.

#### PARAFFIN TREATMENT OF BURNS

The paraffin-wax, or so-called Ambrine, treatment of burns was also severely criticized by our pseudo-scientists. It did not agree with their theories. Its great advantages over all others should make it the standard treatment of burns. During the past five years, we have treated over 25,000 burns with this method and have discarded all others because of its great superiority.

#### COMPENSATION RESULTS

The Compensation Board of New York stated several years ago that one-third of all wounds were infected. This was undoubtedly due to delay in receiving immediate treatment and improper surgical treatment. The New Jersey Compensation Commission reports that 33 per cent of the cases applying for compensation must be referred back to the surgeon for reconstruction.

In a recent article, a noted surgeon reported four excellent results in fractured femurs (children under twelve) in a series of sixty-seven cases. In a survey of 3,000 cases of fracture of the femur (since the war) only 90 of this series had 10 per cent or less of disability. Are these end results something of which we can justly boast? I think not.

Sir Arbuthnot Lane has made the statement that no one who had ever received a fracture of the femur treated by unoperative methods ever returned to active duty on the London police force. How many thousands are permanently crippled as a result of faulty treatment of fractures it is impossible to state. It is certain that if proper methods were employed, much disability could be prevented. Those who persistently oppose the operative method in the correction of vicious fractures have nothing better to offer, and their poor results with the operative method can only be due to the time-consuming, mutilating, unskilled technician and in no way due to the screws and plates, which, if correctly used, caused little or no trouble.

Sterilized steel screws and plates do not carry infection, but the careless and incompetent surgeon does. There is no more occasion for infection in the operative treatment of fractures than in the ordinary hernia or simple appendix. Where the

teaching of Lane is carried out in detail, infection rarely occurs.

Let us cease this useless and almost endless discussion and accept certain demonstrated facts that have been proven meritorious and in advance of obsolete and medieval practices.

We are, to a certain extent, responsible for the growth of bone-setters, osteopathy, chiropractics, sciences, etc., because of our many poor and unsatisfactory results. We stubbornly refuse to accept the value of mechano-electro-hydro-therapy. There is no question but that this field has been sadly neglected. Few hospitals and fewer doctors pay any attention to these methods of therapy. There are other methods of treatment beside the scalpel and polypharmacy.

Some years ago, the writer standardized the methods and practices (the standards being elastic) of the surgeons of the Carnegie Steel Company, with the result that infection of wounds was reduced from 50 per cent to one in 700 (in a series of 77,000 cases).

At present, chaos exists throughout the profession as to the best methods of wound treatment and operation in various types of trauma. Reference to the voluminous literature causes only mental confusion and the investigator is left with conflicting opinions on almost every subject. Some attempt should be made to clarify this situation which would serve as a guide to those seeking the truth and which is based upon scientific facts and accepted practice rather than the theory or opinion of someone with limited experience, but long on theory.

We have advanced so far in surgery the past 25 years that much we do should be relatively standard and further experimentation is useless and provocative of much harm. The author clearly saw the necessity of adopting certain standards at the beginning of the war. Little support was given this plea. The failure to inaugurate a definite policy caused endless confusion and chaos, and, as a result, we did not give the wounded, generally, all the advantages of scientific advances. Let us profit from our mistakes of the war and put into civil practice the best approved methods and discard that which is obsolete and unscientific. The public very often is just a step in advance of us and it behooves us of the profession to keep pace with modern progress.

DISCUSSION ON THE PAPER OF DR. WILLIAM O'NEILL  
SHERMAN

DR. CHARLES H. MAYO, Rochester: It is very interesting to hear a man with such an enormous experience in surgery as the essayist has had, tell us about his work. I do not believe that we have yet completed our work concerning antiseptic details. It will change, and Dr. Sherman expects it will change some day.

David Harem tells us about the dog that had fleas which kept him irritated. We as a profession are constantly kept irritated by the dissenter. It is the dissenters who make trouble before they develop some better method, and the essayist is right in saying that some of the best men in this country wrote articles on and made discussions against the Carrel-Dakin treatment. I want to acknowledge the debt of gratitude we owe to the surgeons, Dr. Sherman among them, for what they did in regard to developing this method of treatment.

DR. M. S. HENDERSON, Rochester: We are fortunate in having had Dr. Sherman come from Pittsburgh to tell us of his interesting experiences. He has the opportunity of observing a tremendous number of industrial accidents. We of the Middle West have not that opportunity.

I shall touch on some things that particularly interested me in listening to this paper. The Carrel-Dakin treatment is undoubtedly the biggest advance we have had in many years. As perfect as it may seem to be, I believe we will strike something better in the future. One thing that is often overlooked in the Carrel-Dakin treatment is that it must be preceded by excellent surgical procedure. Dead tissues must be removed; the wound or wounds should be thoroughly cleaned and an antiseptic introduced which is nearly ideal.

Dr. Sherman mentioned a patient operated on by Meyerding in our clinic. We have had quite a number like that with excellent results, so that we have been encouraged in the continuation of the method.

I was particularly interested in what Dr. Sherman had to say about metal plates. There has been a great deal of criticism of the use of the metal plate, because in recent years the bone graft has come into prominence. Bone grafting is the proper procedure for ununited and delayed fractures, but is hardly proper for recent fractures.

There is a controversy about the open and closed methods of treating fractures. The closed method always will be the method most commonly employed, but the open method has its very definite place. In the Mayo Clinic, I think we are operating on more recent fractures than ever before and I know that our results are better. A perfect anatomic result means a perfect functional result. We do not operate on all, but we do operate on a good many and do not hesitate to use the metal plate, if deemed necessary for fixation. I agree with Dr. Sherman that infection should not follow the use of metal plates if careful technic is used, but I know that infection is more likely to occur from using metal plates than from using absorbable material such as beef bone. I have seen infection develop two or three years after the use of the metal plate; therefore, the infection must be by the blood stream in the late cases.

Infection is a subject that interests us in all kinds of surgery, and during the last year we reviewed all bone

graft operations performed in the clinic, and found that cases of infection were rather higher than we had thought. In old ununited fractures, the infections amount to about 10 per cent, which is too high. This group of cases, however, in which much handling of the tissues during operation and trauma incidental to the dissection of the large amount of fibrous tissue are unavoidable, is difficult to treat.

In a simple fracture, the use of a metal plate should not cause infection, but it has been our custom to remove the metal plate as soon as it has served its purpose and the fracture has united.

DR. KARL CONNELL, Omaha, Nebraska: Dr. Mayo has touched on the sweeping affirmatives of the essayist of the evening. Permit me to inject my personal feelings before opening the discussion. \* \* \*

Regarding the plating treatment of recent open fractures, my own early twelve years of experience at Roosevelt Hospital, New York, with an average of only 900 fractures a year, in no way compared with the experience of the essayist of this evening. My experience has been with a number of young boys in surgery who have not had the advantages of being able to dictate. Over these occasional fractures at the Roosevelt Hospital we boys fought back and forth, yet the result was that out of each hundred fractures we could find only two or three cases in which we thought it would be advantageous to plate. Of course, many operative expedients had to be employed, such as the ice-tong suspension, Stineman pin traction, etc., and occasionally when muscle was interposed the end result would demand open intervention and plating. I have, therefore, no right to detract from the usefulness of the bone plate, yet I regard the sweeping use or advocacy of the plate as courting disaster, and more certainly so in the compound fracture. Certainly not in New York nor in my present location in Omaha, have I seen results to warrant the promiscuous plating of fractures. To the contrary the result has been shocking in the hands of the average surgeon, and Dr. Sherman must take these things into consideration, that neither New York nor the middle west enjoys the rarefied atmosphere of the Alleghenies nor his own surgical skill in handling these cases.

With regard to Ambrine in the treatment of burns, Dr. Sherman asks, "Why this cry about Ambrine?" I answer because it is called Ambrine, and was introduced as a mysterious all-potent healing agent by the press of this country early in the last decade. Had it been called plastic wax—had it been stated that it adhered to crusts—had it been stated that it allowed a free drainage of the wound laterally—had it been stated that it was a better protection for burns than vaseline, that would have been within its rights.

Ambrine has achieved great good in calling attention to the fact that complete protection as with Nature's scab, and daily painless non-traumatizing removal of that scab is a remarkable surgical treatment for burns. But that Ambrine has any advantages over any similar preparation of paraffin, rosin and beeswax, I personally have not been able to observe. A suggestion that may be of advantage: I have found that the burns heal more rapidly if, on dressing the wound each day, a mild antiseptic spray is used. I formerly employed 1 per cent protargol but in recent years

have employed dichloramin .25 per cent in chlorcosan sprayed on the wound before painting on the liquefied wax and reinforcing with cellulose.

With regard to methods of skin graft, Dr. Sherman has ably impressed the most vital point, i. e., that the grafted surface must be surgically clean. I learned this under the late Doctor Chas. McBurney, who achieved in his time well nigh perfect takes by careful preliminary cleansing of the surface and then by gauze wiping to prepare a fresh, clean surface, duplicating what the modern war surgery accomplished by débridement, i. e., dry primary union. We can, therefore, sterilize the wound for skin graft mechanically as well as by the Dakin-Carrell method employed by Dr. Sherman. A combination of the two might prove of advantage.

I express my high appreciation of the forceful manner and personal conviction with which the essayist presents his points.

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### THE CAUSES OF FAILURE OF OPERATIONS FOR CHRONIC APPENDICITIS\*

CHARLES J. ROWAN, M.D.

*Iowa City, Iowa*

The removal of the appendix because of a diagnosis of chronic appendicitis is one of the most frequent procedures in general surgery. Because it can be easily and safely removed, it would seem that the operation should be followed by a cure in practically all cases; but the investigations of surgeons who have carefully followed up their cases show that the results can hardly be considered to be as satisfactory as it would seem they should be.

In 1916 Connell reported that among 212 patients operated on by him during the preceding seven years, there were 48 who failed to get relief of symptoms. He used the term "pseudo appendicitis" in connection with these failures, and especially warned against advising operation for chronic appendicitis in patients who had chronic constipation, enteroptosis, and neurasthenia. Last year Gibson reported the result of his investigation of 555 cases which had been operated on during the preceding six and a half years. He received 426 replies to his letters of inquiry. He divides the results into excellent, satisfactory, and unsatisfactory, and finds that 102 cases should be reported as unsatisfactory.

I have had "follow-up" letters sent to the patients operated on in the surgical service of the University Hospital during the years 1918 and 1919, in whom

the diagnosis was chronic appendicitis. Patients who had other recognized pathological abdominal or pelvic conditions were not included in this list.

The total number of cases was 121, and from these patients we received 94 replies. I have divided these replies under the headings, cured, improved and unimproved, and find that 66 have been cured, 20 are to be classed as improved, and 8 as unimproved. Among the improved we include those who report themselves better, but still having constipation, or vague pains at times, or other indefinite symptoms. There were no deaths in this series and no complication more serious than a stitch abscess, except in one patient who developed a post-operative pneumonia which ran a short and mild course. There were 55 males and 39 females in this number, which is as it should be, since it has long been recognized that appendicitis is more common in the male. Among the cured, 42 were males and 24 females; among the improved, 9 were males and 11 females; and among the unimproved, were 4 males and 4 females; showing that the prognosis as to cure has been much better in the male patients.

We have always regarded the history of a former acute attack as an important diagnostic point in chronic appendicitis, and we find that in our 94 cases there were 68 who gave a history of acute attacks at some previous time, and 26 who did not give such a history. Among the cured cases, 52 gave a history of an acute attack while 13 did not; among the improved cases, 11 had had acute attacks and 9 had not; and among the failures, 4 admitted acute attacks and 4 did not. We learn from this that the prognosis as to cure is much better when there is the history of former acute attack.

In the operation reports, it is found that the appendix is described as definitely pathological in 89 cases, and as doubtful or showing no pathological change in 5 cases; and of these 5 cases, 1 is listed in the improved column and 4 in the unimproved. This shows that 19 out of 20 improved cases and 4 out of 8 of our unimproved cases showed pathological changes in the appendix, and still were not cured by the operation.

In all patients who come to us complaining of chronic appendicitis and where the history and findings are not completely typical, the diagnosis is practically made by exclusion, plus the direct evidence of a diseased appendix. A patient without a history of an acute attack is regarded as atypical, and operation is not advised unless the symptoms

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are very definite and characteristic. If the patient complains of gastric symptoms, while we realize that hyperacidity, pylorospasm and epigastric tenderness may be caused by chronic appendicitis, we do not admit it as the cause in any individual case until gastric analysis and x-ray series have been negative; and even then we make an exploratory rather than the muscle-splitting incision. It is now generally recognized that chronic appendicitis bears an important etiological relation to gastric ulcer and cholecystitis and we find them frequently co-existent. By observing these precautions many gastric and duodenal ulcers and cases of cholecystitis have been found in patients with chronic appendicitis (these cases are not included in this series), and if the appendix only had been removed they would have been found added to the number of failures.

In like manner, if there is anything in the character, location, or reference of the pain which suggests the kidney or ureter as a possible explanation of the condition, we are not satisfied that a negative urinalysis excludes the kidney or ureter, but refer the patient for x-ray examination, cystoscopic examination, and pyelography if the urologist thinks it indicated. We realize that in chronic appendicitis there may be found slight increase in the number of leucocytes in the urine, but we believe that their presence puts the burden of proof on the appendix, and on the other hand it is well known that pathology in the kidney or ureter may produce symptoms, while examination of the urine shows it to be normal. By referring such patients to the urologist, even in the presence of normal urine, we have been led to refuse operation for chronic appendicitis in several cases, where if the appendix has been removed we would have had to add to the number of our failures.

In dealing with pronounced neurotics it is often difficult to come to a definite conclusion as to diagnosis. It is perfectly true that a neurotic patient may have chronic appendicitis, but on the other hand such a patient, by complaining of vague pains, perhaps especially located in the right lower quadrant accompanied by an indefinite tenderness may easily lead one to make a diagnosis of chronic appendicitis when it is not present; and again, the removal of a chronically diseased appendix in a patient who is decidedly neurotic is very likely to disappoint in the amount of improvement which follows, and may fail to give any relief whatever. Operations for psychic effect have long since proven

their worthlessness. Patients with mucous colitis, even if they have pronounced tenderness in the region of McBurney's point, will generally fail to be benefited by an appendectomy; and this also applies to patients with marked visceroptosis.

In the cases reported as improved, it is difficult as a rule to explain why recovery has not been complete. Constipation is complained of by many of these patients, and it is possible that in some of them it was the cause of the appendicitis, and that the removal of the appendix has naturally failed to relieve it. In others it is possible that, being somewhat neurotic, they are bothered by the scar enough to complain of pain. In others there are undoubtedly accompanying minor conditions such as moderate enteroptosis, pelvic displacements, etc., which still cause some discomfort; and in some cases adhesions may be the explanation for incomplete relief. Gibson has noted a very marked improvement in his results recently, and is impressed by the fact that this improvement has occurred since iodine was discontinued in the preparation of the patient. He now uses 5 per cent picric acid in 95 per cent alcohol, and believes that although its antiseptic action is as strong as tincture of iodine and its penetrating power as great, it is less irritating to skin and peritoneum, and that peritoneal adhesions are not nearly so likely to occur following its use as a skin antiseptic. The report of such a reliable observer should carry considerable weight, and we have recently begun the use of picric acid in the preparation of the abdomen for laparatomies.

After a careful study of the hospital records of the 8 failures, we have concluded that 3 patients had gastric ulcer at the time of the appendectomy, and that this accounts for the failure in these three cases. They were males with gastric symptoms and findings on gastric analysis or x-ray examination which pointed to ulcer. Exploratory incisions were made in these cases, and ulcers could not be demonstrated at the time of operation. Following our rule, which is not to make a gastro-enterostomy unless distinct evidence of pathology is found in stomach or duodenum, we only removed the appendices in these cases, one of them being distinctly pathological, and the other two doubtful. The persistence of the symptoms has convinced us that the ulcers are still making trouble. We are still of the opinion that the proper treatment in these cases, where the ulcer is probably present but cannot be demonstrated, is to remove the appendix and advise



medical treatment of the ulcer, hoping that the removal of a diseased appendix, which may have caused the ulcer, will aid in obtaining a medical cure. We do not think that a gastro-enterostomy should be lightly undertaken in the absence of evident pathology, because in such cases it is likely to do more harm than good. In one male patient with gastric symptoms but negative x-ray and gastric analysis findings, an exploratory operation failed to show any pathology in gall-bladder, stomach or duodenum, but did show a very evident chronic appendicitis for which the appendix was removed. The patient reports that he is still having the same symptoms. We feel that he may have a gastric ulcer, or a strawberry gall-bladder which was not recognized at the time of operation.

One patient was a hysterical girl, whose badly diseased appendix was removed without benefit to her. The explanation of failure in her case is the hysteria.

One female patient had a pronounced viscerop-tosis and the only pathology found in the appendix was a kink at its middle. The appendix was removed, but no improvement resulted, nor was it to be expected.

In one female patient with atypical history, in whom a diseased appendix was removed through a muscle-splitting incision, no improvement followed, and we are at a loss to explain the failure unless it be that additional pathology was present in the abdomen and was not discovered because a muscle-splitting instead of an exploratory incision was used.

In another female patient, where a diseased appendix was removed through an exploratory incision, we are not able to account for the improvement being so slight as to cause her to be listed among the failures.

After a careful study of this series of cases, we must admit that the results of operation for chronic appendicitis in our hands are not satisfactory and that there is considerable room for improvement. In attempting to secure better results we believe that the following points are of great importance:

1. These patients should have more careful examination and often more prolonged observation, especially if the condition is not in every way typical.

2. No patient should be regarded as having typical chronic appendicitis unless a history of a former characteristic acute attack is obtainable.

3. Extra care and consideration should be used

before advising operation in neurotics, especially those with colitis or viscerop-tosis.

4. More exploratory incisions should be used in preference to the muscle-splitting incision, and always in atypical cases; and the exploration should not end with the discovery and removal of a diseased appendix.

5. Believing that a considerable amount of trouble complained of after operation may be due to adhesions, we regard the suggestion of Gibson as valuable, and will try out picric acid instead of iodine in the preparation of the site of operation.

#### DISCUSSION

DR. ARTHUR C. STRACHAUER, Minneapolis: It is a great satisfaction to have heard Dr. Rowan's sane and important presentation of this subject. In the University Clinic in Minneapolis we have practically discontinued the employment of the diagnosis of chronic appendicitis as a single entity. Likewise, we have discontinued the employment of the muscle-splitting McBurney incision, using it only in the cases of children and young adults in the early stages of an attack of acute appendicitis, or at an "interval operation" following a definite history of acute attacks. Much confusion exists regarding the pathology and nomenclature of the various forms of appendicitis. The cases in which we get a history of previous and repeated attacks we prefer to call cases of recurring appendicitis. Even though the muscle-splitting incision of McBurney is satisfactory for the removal of a definitely diseased appendix, the incision is inadequate in that it does not permit a general examination of the abdominal contents. The frequency with which co-existing diseases obtain in the gall-bladder, stomach and duodenum, makes removal of an appendix through a McBurney opening an incomplete procedure. The patient can be cured only by the performance of complete surgery. Some of the patients who have had unsatisfactory results following appendectomy have been patients in whom cholecystitis or cholelithiasis, ulcer of the stomach or duodenum, have been overlooked. I have opened the abdomen and found a grossly diseased appendix with coexisting ulcer of the stomach, ulcer of the duodenum, and a diseased gall-bladder containing stones. Surely the performance of an appendectomy here could hardly be expected to cure the patient.

Appendicitis must be looked upon as the result of a hematogenous infection which frequently involves the gall-bladder, pancreas and kidney, causing ulcer of the stomach and duodenum. Most of these infections clear up, or any one, two or three of the lesions may remain permanently. This conception explains the complicated pathological findings present on opening of the abdomen. The clearing up of all primary and secondary foci of infection is, of course, essential to success.

Surely, the day for treatment of constipation, mucous colitis and Glenard's disease by the performance of appendectomy has passed, and it is hardly worthy of discussion; we do not expect results from surgery directed to that type of disorder.

In addition to the unsatisfactory results following appen-

dectomy due to the development of postoperative adhesions, resulting from the trauma to the peritoneum or the irritation from the tincture of iodine, I believe that the routine covering over of the inverted stump by the meso-appendix is one of the common causes of dissatisfaction. I am sure that many of us know of cases in which so-called chronic appendices were removed and the patients not only not cured but left in a worse condition, having more pain and either increase in ileocecal stasis or the development of such stasis which did not formerly exist. The routine fastening of the meso-appendix over the region of the stump of the appendix in some cases exaggerates an already existing Lane's kink or causes an artificial one. Upon careful examination of the terminal ileum it will be found, in a considerable number of cases, that there is a strip of tissue containing fat running down from the last inch or inch and a half of the ileum and attaching itself to the meso-appendix. Sewing the meso-appendix over the stump of the appendix, in such cases, causes the kink of the ileum. The meso-appendix should be sewed or tied over the stump of the appendix only in those cases in which it will not cause this kink.

The matter of the irritation from tincture of iodine causing adhesions, referred to by Dr. Rowan, is an important consideration, not only in the performance of appendectomy but in every laparotomy. While we routinely employ the iodine preparation of the abdomen, by careful attention to the walling off of the wound with towels held by clamps and in addition the placing of moist compresses over the wound margins, the iodine can be completely excluded.

Dr. Rowan has given us a valuable message. There is no question that too many appendices have been removed in the past, and that much pathology has been overlooked by the removal of the appendix through a small incision.

DR. M. H. CREMER, Red Wing: When I first read the title of Dr. Rowan's paper I concluded that it was a very appropriate subject to bring to the attention of both the medical and surgical professions. Then, after receiving a copy of the thesis on the subject by the essayist, I could not help but recall the numerous instances in my own experience, especially in the earlier days, when surgical differential diagnosis was not so readily made. And up to this time, with all the appendix experience that the profession has enjoyed, we still make errors.

Sometimes the symptoms are so varied, so perplexing, and so misleading that they offer us a ready explanation of the failures of operation. Just a few weeks ago I operated on a gentleman past fifty who gave a history of recurrent colic extending over a period of two years, acute appendicitis three years previous. Stomach analysis was negative. An exploratory incision disclosed nothing except three small concretions in the tip of the appendix and some kinking. He left the hospital in ten days. On his way home he suffered an attack of exactly the same kind of colic as before and was brought to my office. The incident occurring as it did would have made me think of gall-stones, had I not previously investigated.

In all cases, with the exception of acute appendicitis, I think we should adopt the incision whereby we can investigate the interior.

I want to call attention to another matter of interest—

Lane's kink. This frequently gives rise to abdominal disturbance. While this abnormal condition is ignored by some, it can, to my mind, produce symptoms. The ileum is not only drawn down and angled, but it is rotated upon itself, so to speak, which naturally must disturb the normal peristaltic wave, possibly producing a reversed fecal current. I always release a kink, and by so doing have often effected relief of symptoms in cases where a previous appendectomy had been done.

I think that in all cases of appendiceal irritation there is a marked resistance or rigidity over the right rectus border, and unless I get a history of repeated attacks without this resistance in the abdominal wall, I defer operation or rather advise against it. We must largely rely on the history as the patient gives it, not as it is suggested to him, because a neurotic accepts suggestions which may lead to a false interpretation of the actual symptoms present. Many times postoperative symptoms are neurological. The pain may be due to imperfect bowel movement, or the traumatization of the ilio-inguinal or some of its small branches or adhesions. These can be largely avoided by keeping the fingers and retractors out of the belly. Personally, I never use instrument retraction in abdominal operations and avoid as much as possible contact with the parietal peritoneum.

DR. CHARLES H. MAYO, Rochester: This paper reminds me of a similar one written by Dr. Cabot years ago in which he reported his investigations of patients operated on in two of the larger hospitals of Boston, showing that one patient out of six failed to be relieved of the symptoms he complained of.

The old McBurney incision has been very properly brought before us. The McBurney operation is a good operation for children, but not a good one for adults, because although there is appendicitis, there is no reason why the appendix, which is so commonly a focus of infection, should not play an important part in the development of pathologic conditions in the upper abdomen, such as gall-bladder disease or ulcer; consequently we should explore the upper abdomen in the adult except in acute conditions, where one may not care to do any exploration.

The subject has been very thoroughly covered, and I think it is good for us from time to time to have such discussion.

DR. ARCHIBALD MACLAREN, St. Paul: I feel that Dr. Mayo struck the keynote when he said that he was always afraid of those patients on whom he operated for chronic appendicitis. Personally, I have made so many mistakes and have gotten so many of these letters, that I know there is no imagination about it. An appendix that really needs attention had better be removed through a right rectus incision. A cross muscle incision has caused death in some of my own acute cases. That is one place where the cross muscle incision should never be used—the acute case. I remember one of these cases so well in a girl who got sloughing of the abdominal wall apparently following a tearing of the fascial planes, and she died as the result of a superficial infection, the peritoneal infection, as was shown at post-mortem, having subsided.

DR. A. E. SOHMER, Mankato: These cases are usually instances of mistaken diagnoses, and I want to report a case

that occurred in a railroad man. After an accident it was thought he had appendicitis due to the injury, so-called traumatic appendicitis, because he had previously pain in the right inguinal region. His appendix was removed; he continued to have pain; post-operative adhesions were removed and he continued to have pain. In analyzing the case, it was found that the pain followed the course of the ilio-inguinal nerve. X-ray showed a spondylitis on the right side causing pressure on the nerves. There is an instance where the case simulated chronic appendicitis. He could not have been cured by removing the appendix because the wrong end of the nerve was attacked.

DR. S. MARK WHITE, Minneapolis: I wish to call the attention of the Program Committee to an omission when discussing failures in the operative treatment of chronic appendicitis in leaving the internist out. The internist is a considerable factor, and I should like to call attention to one or two matters in this connection.

The surgeon has already indicated his interest so far as the problem of diagnosis is concerned, and I do not propose to touch on that at all; yet there are a good many of these cases in which the diagnosis cannot rest solely on the results of immediate operation. Some of the cases of so-called chronic recurring appendicitis or chronic appendicitis after an acute attack can be decidedly benefited by proper dietetic and hygienic management, and in discussing this I want to say that after the removal of the appendix, may not the appendix condition be combined with some other general conditions, such as spastic constipation or the atonic type of constipation which can be recognized and by proper, prolonged and intelligent dietetic management combined with hygienic management improve the muscle tone, and may not this be a considerable factor in the surgical treatment of chronic recurrent appendicitis?

DR. C. J. ROWAN, Iowa City, Iowa: I think probably there is good reason for using the term recurrent appendicitis rather than chronic appendicitis; nevertheless, I do try to differentiate between the two conditions. The surgical pathologist absolutely refuses to return a pathological diagnosis of chronic appendicitis, and he calls them healed appendices. In describing a section he will speak of a pronounced lymphocytic infiltration and of white lines along the lymph channels. It seems to me this is an indication that the condition has not healed—that there is still some inflammatory reaction present. I did not take time to differentiate between a chronic and recurrent appendicitis, in that I believe the term recurrent appendicitis may be applied to those cases that have had more than one acute attack of the disease with complete absence of symptoms in the interval. The term chronic appendicitis should be used in the patient who gives a history of an acute appendicitis at one time, but who has a continuous symptomatology. If chronic appendicitis does not exist as a distinct clinical entity, that probably has a great deal to do with the difficulties in the diagnosis and with the mistakes in diagnosis.

In regard to Dr. White's discussion, I feel that medical treatment after the operation may lessen the number of improved cases, but I do not think it will have much to do with the number of failures because failures mean mistakes in diagnosis.

## PRIMARY CARCINOMA OF THE LUNG\*

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Though primary carcinoma of the lung is rather an unusual disease, we feel that it is more common than was formerly supposed. In 46,169 autopsy reports collected from various European cities, 105 cases of primary carcinoma of the lung were found, or one in every five hundred sections. Perritz reports seventeen out of 21,134 autopsies; Seydel of Munich, 181 cases out of 10,829; Passler, 16 in 9,246; in Lenhart's 2,956 autopsies, 12 cases were found in two years; in St. George's Hospital, there were no cases of primary carcinoma of the lung discovered. Ewing states that this disease occurs in one per cent of all carcinoma; Kaufmann that it occurs in 1.83 per cent. In 2,393 general admissions to the University Hospital in Minneapolis in seventeen months, there were 82 cases of carcinoma. Four of these on the medical service were diagnosed as primary carcinoma of the lung, and were later confirmed by autopsy.

The first description of this disease was made from autopsy by Boyle in 1810. The next case of any importance was reported by Stokes in 1837. Since then over 500 cases have appeared in the literature. The reports of Lenhart, Passler, Perritz, Seydel, Wolf, Kuttner, Rolleston, Adler, Kauffman, Ewing, Bryan and Carmen have brought the subject down to the present time.

Statistics show that primary carcinoma of the lung affects males more frequently than females; and that it occurs more often between the ages of fifty and seventy. A few cases, however, below fifty have been reported. Eberman records one in a child nine years old, and Adlhowies one in a child five and a half years old. In our cases, three out of the four were males, and the ages were respectively: 58, 48, 49, 40, making an average age of 48 plus.

Before a study of the reports of the Cobalt miners at Schneeberg and of the workers in the granite quarries of Vermont, it was thought that occupation bore some relation to the prevalence of the disease; but the investigation proved that this disease was found no more frequently in these occupations and

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districts than in any other. Landis, on looking into the dust occupational diseases in this country, found no relationship between them and carcinoma of the lung.

The relations of tuberculosis to carcinoma as a causative agent is questionable. Shaw accepts only eight of Wolf's thirteen cases of tuberculosis occurring in thirty-one cases of primary carcinoma of the lung. Fowler in thirty cases found but two with tuberculosis. Some think trauma to be a factor in the production of carcinoma, but the literature does not support this idea. It may, however, follow primary sclerotic lesions.

From the pathological standpoint, three types of carcinoma of the lung should be considered, depending upon histogenesis: (1) that rising from the bronchial epithelium; (2) from the bronchial mucous glands, and (3) from the alveolar epithelium. All of our cases arose from the bronchial epithelium, or from type one. In this type, the mass, small in the early stages, extends first along the lymphatics or blood vessels of the mucosa, then through the lymphatics into neighboring bronchial and mediastinal glands from which wide-spread metastasis may extend into the liver, lungs, pleura, kidneys, spleen, brain, eye, thyroid, diaphragm, skin, pancreas, gall bladder, spinal cord, bladder and finger tips. It is rare for type one to produce large masses in the lung, though obstruction of the bronchus may occur, producing either bronchiectasis or atelectasis. The right lung, according to statistics, is involved in 54 per cent of the cases, and the left is 35 per cent, 10 per cent being bilateral. In our cases the right lung was affected in three cases.

Primary carcinoma of the lung may appear as: (1) a chronic pulmonary inflammatory disease; (2) a localized tumor; (3) a chronic pleurisy with effusion.

The onset is usually gradual. The patient complains of a constant pain, located deep in the chest. It does not radiate early, and it is uninfluenced by anything that the patient may do. In one of our cases, however, the patient thought that he obtained slight relief when he tied a cloth about his chest in a certain way. But strapping his chest with adhesive plaster, and applying heat gave no relief. The pain probably is not sharp or severe until the pleura is involved; then the pain may be severe, and may radiate around the chest wall or into the abdomen. It is not relieved by a pleural

effusion. The pain was present early in all of our cases, and its presence was of the greatest diagnostic aid. In secondary carcinoma of the lung, the pain is not an early or an important complaint.

Another symptom is cough, which may appear at any time of the disease, either constant or paroxysmal, mild or severe. In Case 3 of our series the cough was distressing; in the other three patients it was present, but it was neither constant nor distressing. In Case 3, following the cough, the patient brought up quantities of bloody tenacious mucus which had a foul odor. For a time there was a great deal of pus in the sputum due to rupture of an abscess about the tumor mass. Either an abscess, bronchiectasis, or gangrene may account for a large amount of foul sputum. In Case 1, the sputum corresponded to the currant jelly type, and in the other two, the sputum was streaked with blood. There were no tumors or fatty degenerated cells. Hemoptysis was present in all of them as an early and constant symptom. It is reported to be present in 72 per cent of cases. It rarely occurs in a large amount or proves fatal. Only two cases are reported in which death followed a severe hemorrhage.

In our series, when the patients exerted themselves, dyspnea was present and progressive from the beginning, and before any complications appeared. This symptom is usually much greater when the tumor mass in the lung is large and grows rapidly, or where there is fluid in the pleural cavity, or pressure on the trachea. The pleural cavity on the side of the disease was obliterated in two of our cases. In two cases there was effusion. When fluid is present, important diagnostic aids may be obtained by pleural taps showing blood-stained fluids which may contain tumor cells, and may have a low specific gravity. It is reported in half of the cases of primary carcinoma that the pleural cavity is obliterated by growth. Carmen states that in 60 per cent of the cases at the Mayo Clinic, dyspnea from metastatic growths was not proportionate to the amount of "existing pathology." Most writers feel that dyspnea is not a prominent symptom of metastatic carcinoma of the lung.

An average loss of thirty pounds in weight, progressive weakness and cachecia occurred in our series. Fever of 102.5 degrees was reached in Case 3, due to an abscess accompanying the disease. It was present as a terminal finding in the other three cases. We do not consider fever to be



a symptom of carcinoma of the lung except as an evidence of complication. However, it usually occurs in about a third of the cases.

Symptoms due to pressure are usually later phenomena. Dysphagia caused by direct pressure on the esophagus, dyspnea from trachial pressure, and hoarseness due to pressure on the recurrent laryngeal nerve were found in two of our series. Distended veins of the chest wall were noted in the four cases at some time during the course of the disease, usually as a later symptom. Cyanosis, edema of the face, neck, and arms, due to pressure on the intra-thoracic vessels, occurred in one case. No patient in our group showed pressure on the brachial plexus.

Tissue was removed for microscopic study in Cases 3 and 4. In Case 3 an axillary gland was shown to be inflammatory tissue. In Case 4, inflammatory tissue was removed through an incision between the ribs from what was thought to be a pleural space. Later a mass appeared externally over the lower sternum, which proved to be carcinomatous tissue. External glands are rarely involved until late in the disease, so that microscopic study, while diagnostic when it is possible to procure tissue, rarely gives much aid. The early blood picture, however, is of value. There is a typical secondary anemia with marked variations in the nuclei of the polymorphonuclearneutrophiles, showing many atypical forms with small lobes and small buds and horseshoe shaped nuclei with small buds projecting from them. There is marked segmentation of the nuclei in some cells. The above findings were noted in Cases 3 and 4.

The x-ray, in our experience, has not been of material aid in the diagnosis of primary carcinoma of the lungs. There is no characteristic appearance as seen on the x-ray plate. The most frequent finding is a gross peribronchial thickening with nodulations seen usually in the lower or middle lobes. If seen early the condition is most likely to be interpreted as an unresolved pneumonia, bronchiectases or chronic pulmonary abscess. Later plates, however, showing the rapid extension of the mass, with or without involvement of the pleura, will either give the diagnosis or confirm the previous clinical diagnosis of carcinoma. The greatest aid which the x-ray can give is in ruling against metastatic tumor or tuberculosis. Both conditions are easily differentiated by x-ray from primary carcinoma, except where the pleura is involved.

Though a bronchioscopic examination was not made in any of our cases, we believe that it has a very valuable place in the early diagnosis. By this examination, a growth may be discovered. Yaukauer reports malignant growths as an accidental finding in 12 per cent of his cases.

Metastases have occurred in most of the cases reported, usually in the bronchial and mediastinal lymph glands. This fact accentuates the necessity of a very early diagnosis. In 33 of Adler's 374 cases, no metastases were present. Metastases occurred in all of our cases.

It is stated that individuals with a primary carcinoma of the lung live from three to twenty-seven months from the date of the first symptom. Our cases lived twelve, eight, nine, and eight months respectively, an average of nine plus months. Few cases are reported as cured. Death is usually due to: (1) rupture of the vessels; (2) thrombosis; (3) pulmonary edema; (14) asphyxia; and (5) cachexia.

A very early examination outside of a possible bronchioscopic investigation is negative. Later, with a lung infiltration, there are the usual findings for such a condition. In cases where extension occurs along the bronchial wall, and produces bronchiectases, the usual findings for the bronchiectatic condition will be found. It is this condition which makes necessary careful and frequent observations with laboratory and x-ray studies before a correct diagnosis can be made.

Where metastases occur in the pleura there is a marked retraction and fixation of the chest wall, a lagging of the side on inspiration, weak fremitus and breath sounds, and usually no rales. The various pressure phenomena and a trachial tug may be observed. The presence of the latter in Case 3 of our series simulated an aneurism. The heart may be displaced.

Our greatest difficulty came in differentiating carcinoma from tuberculosis, especially when the process extended to the pleura. This difficulty was also experienced in the chest department of Jefferson Hospital; among 1,200 lung cases, 72 were incorrectly diagnosed. Five of these proved to be primary carcinoma of the lung, so that one patient in every 250 diagnosed as tuberculosis had a primary carcinoma of the lung. Of those wrongly diagnosed, one in every fifteen had the disease. Eleven per cent of Ashe's 551 autopsies were not tuberculous; seven of these had a primary carcinoma of the lung.



We feel that no one of the symptoms or signs given above is diagnostic of primary carcinoma of the lung. But when a patient has dyspnea, deep dull chest pain with hemoptysis, and possibly some abnormal chest findings, we should consider malignancy of the lung.

## SUMMARY OF CASES

## CASE 1.

Female, age 58.

Admitting Diagnosis: Tuberculosis.

Complaint: Blood streaked sputum, pain in chest, and weakness.

Physical Examination: Few constant moist râles near hilus left lung and loss in weight, secondary anemia, blood-streaked sputum repeatedly negative for tuberculosis, negative Wassermann, hemoglobin 65 per cent.

X-ray: First examination negative; later agreed probably carcinoma.

Course: Lived twelve months.

Diagnosis: Primary carcinoma left lung.

Autopsy: Primary adeno-carcinoma left lung. Metastases: 1, Liver; 2, Pleura; 3, Bronchial, and 4, Mediastinal glands; 5, Adrenal; 6, Kidney.

## CASE 2.

Male, age 46. Entered University Hospital September 16, 1920; died October 1, 1920.

Admitting Diagnosis: Weakness left arm and left leg.

Complaint: Weakness left arm and leg.

History: Stated about one year previous to entrance coughed and raised blood-stained sputum. In January, 1920, while working on farm, felt dizzy and next day felt well. Three days later noticed gradual and progressive weakness of left arm and then of left leg.

Physical Examination: Sluggish mentally, weakness left arm and left leg, pupils irregular and sluggish in reaction, papilledema of the fundus.

Chest: No movement, flatness of the entire left chest, tactile and vocal fremitus absent, interspaces bulged, and paravertebral dullness present.

X-ray: Probable carcinoma of lung.

Laboratory: Urine negative. Hg. 80 per cent, R. B. C. 4,800,000, W. B. C. 15,200, 90 per cent P. M. N., smear negative. Wassermann negative. Chest tap: clear fluid, 1008 sp. gr., 430 cells, 98 per cent lymphocytes.

Diagnosis: Primary carcinoma of the lung with brain metastases.

Autopsy: Primary carcinoma bronchi, complete atelectasis right lung. Metastases: Pleura, dura, right adrenal, pericardium.

## CASE 3.

Male, age 49. Admitted to University Hospital January 5, 1921; died March 25, 1921.

Admitting Diagnosis: Asthma, aneurism or bronchiectasis.

Complaint: Pain in right chest, severe cough and bloody sputum, weakness, loss 50 pounds in weight.

History: Symptoms appeared six months previously.

Physical Examination: Chest: Lagging right side, decreased fremitus, relative dullness upper part anterior chest, some impaired resonance anterior posterior, breath sounds rough, expiration prolonged. Tracheal tug was present and

apex of heart displaced to left. Axillary gland removed and found to be inflammatory.

X-ray: Mass upper lobe right lung, apparently in contact with mediastinum. X-ray on February 17, 1921: Aortic type of heart, diffuse tuberculosis right lung, large mass thought to have been inflammatory. X-ray on March 17, 1921, findings simulated entrance x-ray examination. X-ray on March 24, 1921, showed pneumonia right upper and middle lobes.

Laboratory: Hg. 70 per cent, smear negative, urine negative. Blood smears show changes described by Downey & Habein. Wassermann negative, sputum repeatedly negative for tuberculosis.

Diagnosis: Carcinoma right lung, with abscess.

Autopsy: Primary carcinoma right bronchus. Metastases: Lung, pleura, lymph nodes, liver, adrenals, kidneys, thyroid.

## CASE 4.

Male, age 40. Admitted to University Hospital March 18, 1921; died September 23, 1921.

Admitted Diagnosis: Pleurisy with effusion.

Complaint: Chest pain, dyspnea and weakness.

Physical Examination: Right chest fixed, flattened chest wall, dilatation of superficial veins, dullness on percussion over posterior chest from spine of the scapula down, fremitus diminished.

Laboratory: Hg. 56 per cent, W. B. C. 14,000. Smear as in Case 3. Wassermann negative. Urine negative. Tissue from pleural space negative. Tissue from external anterior chest wall proved to be carcinomatous tissue.

X-ray: 1. Probably bronchiectasis right and left lobes. 2. Before death, probably primary carcinoma bronchus with metastases.

Diagnosis: Primary carcinoma right lung.

Autopsy: Primary carcinoma right lung. Metastases right lung, pleura, diaphragm, liver, kidneys.

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DISCUSSION ON THE JOINT PAPER OF DRS. R. I. RIZER  
AND H. C. HABEIN

DR. S. MARX WHITE, Minneapolis: This paper is very timely for the reason that the incidence of primary carcinoma of the lung is apparently increasing. It may be a matter of opinion whether it is because of better diagnosis, or whether the disease, like many other types of cancer, is on the increase. Certainly, better diagnoses play some part in the recorded increase of this condition; yet it is rather surprising to one who has been studying these conditions with care to be compelled to feel that he sees more of primary carcinoma of the lung than before. That has been my own experience. I have seen within the last three years considerably more cases of primary carcinoma of the lung than formerly.

Dr. Rizer mentioned certain points which are of considerable value in the clinical diagnosis of this disease.

I call attention again to the factors of deep pain in the chest and relatively early dyspnea. They are important symptoms of lung cancer. Hemoptysis is a sign which should receive attention and which should lead to a very careful study clinically and roentgenologically. Of course, today we feel that when a primary carcinoma of the lung has been diagnosed it is a hopeless situation. The methods of treatment of lung cancer by the surgeon have not yet been perfected, and it is only by careful attention to the possibility of cancer that one could recognize the disease in its earliest possible stage and be hopeful of successful surgical attack.

So far as other methods of cure, such as x-ray and radium, are concerned, we must certainly wait a considerable period of time before any judgment, except an unfavorable one, may be given.

DR. R. I. RIZER, Minneapolis (closing): As Dr. White brought out, primary carcinoma of the lung is rarely diagnosed early. Of the cases that have been operated on, most of them were diagnosed as bronchiectasis, chronic pulmonary abscess, or indurated pneumonia, and it would have been quite difficult pathologically to show cancer at the site where it was thought to be a bronchiectatic cavity. The repeated negative sputum examination I think is of great value, particularly as showing the absence of tubercle bacilli in a large number of cases. Of our series of cases and of those seen in other hospitals earlier, a diagnosis of tuberculosis or some other condition was made before we saw them. The repeated absence of tubercle bacilli in the sputum was one of the great helps in picking up these cases early.

Another point is the inability of the x-ray to diagnose them early. From a therapeutic standpoint, there are mighty few cases reported in the literature with any show

of success. Some men reported cures up to three years; they were not primarily diagnosed, but were operated for a lobectomy with the idea of having a bronchiectatic condition to deal with.

The x-ray apparently is going to help a great deal, particularly deep roentgen therapy and cross-firing. The greatest drawback to surgical intervention to my mind has been metastasis, which occurs so much earlier in the lung than in any other part of our anatomy.

THE EXAMINATION OF TEETH IN GROUP  
MEDICINE\*

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The literature on dental subjects for the last few years does not give credit to the value of full mouth roentgenograms and the necessity of such examination apparently is not entirely appreciated either by the medical or the dental professions. Certain members of both professions still consider it quite ridiculous to examine, roentgenographically, the mouth of a patient wearing a full upper or lower denture. However, Eusterman's findings, in a study of roentgenograms of the mouth of 290 patients wearing either full or partial dentures, have demonstrated the importance of this phase of our work. Obviously a full mouth examination not only is necessary, but is the patient's due, if he is suffering from a systemic condition and a focus of infection is suspected. Besides this group of patients, are those who are undergoing thorough examinations from the standpoint of prevention of disease.

In diagnosing affections of the teeth, the existing pathologic condition should be visualized as it is when the teeth are removed surgically. The open view operation has made this possible since the exact condition may be seen, while with the older methods it is necessary to work more or less in the dark. For this reason it is important that the dental diagnostician should have surgical training.

If complete extraction is necessary and a full denture required, especially in elderly persons, it is well to explain carefully the probable results. Many patients are shocked by the change and regret having had the extraction. While the elimination of dental infection is of primary consideration, nevertheless the dental surgeon should keep in mind that the patients are to have dentures and that co-operation with the prothodontist should begin be-

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fore operation. In many instances preoperative models and facial measurements are advantageous.

It has been proved beyond doubt that a casual glance into the mouth with the idea of noting suspicious teeth, such as those supporting bridges and crowns, or holding large fillings, and so forth, is worthless. The deciding question is whether or not the clinician actually wishes to know if the teeth with their investing tissues are to be considered possible factors in the condition of the patient. This conclusion can only be reached after the examination of thousands of patients by full mouth roentgenograms. Residual roots, granulomas, and impacted teeth are often found under plates that have been worn for many years, and their removal has relieved many patients suffering from systemic disorders, particularly iritis, and one type of arthritis, neuritis, and so forth.

The roentgen-ray evidence should be carefully considered while the patient is under observation. The many advantages in checking up the clinical and roentgen-ray evidence at the same time cannot be over-estimated. The full mouth roentgenogram makes it possible to compare densities, which is just as necessary in dental work as in orthopedic work, when, for example, an abnormal condition of the right knee can best be demonstrated roentgenographically by a comparison with a normal left knee. Likewise in dentistry, the lower first molar may appear to be abnormal, but on comparison with the opposite first molar, one may be surprised to see that the condition is normal.

During the past year, approximately 28,000 patients were examined in the Dental Section of the Mayo Clinic. A review of the histories of these patients discloses ample evidence that the usual method of extraction is far from adequate. Residual roots and granulomas, as well as impacted and unerupted teeth were not infrequently found in supposed edentulous areas, as shown by Eusterman. Thirty per cent of these patients had roots, 4 per cent had impacted or unerupted teeth, and 3.5 per cent had residual granulomas. With the open view operation of extraction which is now known as alveolotomy it is practically impossible to overlook such conditions; this is proved by post-operative roentgenograms made routinely. The literature abounds in criticism of this method, yet when it is carried out with proper restrictions, the results are most satisfactory.

Physicians should encourage the routine examination of teeth except in hopeless or emergency

cases. Time is an important factor in emergency cases; however, the dental examination can be postponed until during convalescence after operation. The condition for which the patient is operated on need not necessarily be due to mouth infection to warrant the dental examination, but the elimination of such infection is of material aid in the after care of the patient, and in the prognosis.

Oral infection cannot be eliminated by extraction alone. Treatment for pyorrhea and thorough prophylaxis both are often necessary. Great care should be exercised with regard to the number of teeth extracted at one time, and the length of time between operations. This is also true of prophylactic treatments. There should be a limited amount of scaling at the first appointment and it should not be repeated for several days.

The profession of dentistry should be discouraged from making promises to patients as to the possible result following the extraction of teeth with evidence of infection. They need the co-operation of the physician and are only responsible for the field in which they work. An intelligent report with regard to the dental findings is desired from the dentist by the physician who should take the responsibility of advising and encouraging the patient as to the outcome of the dental treatment.

The dentist in making his report divides the teeth into two groups; those which should be removed for local reasons, and those which should be removed when systemic conditions warrant the procedure. Therefore, the removal of teeth in patients in the first group is a question for the dentist to decide, providing the patient's physical condition is such that he can stand the operation, and of those of the second for the physician. Teeth with marked evidence of infection at the roots, certain types of impactions, and teeth affected by pyorrhea to such an extent that treatment is of no avail, compose the first group. In the second group are listed pulpless teeth that are negative to the roentgen-ray, and their extraction is advised only when the systemic condition is traced to a focus. Thus many patients are allowed to retain pulpless teeth, which, however, should always be considered questionable. Therefore, to say that all pulpless teeth should be extracted is doubtless too radical at the present time.

#### CONCLUSIONS

1. It is necessary that the dental report shall be based on the roentgen ray, making use of full mouth pictures, and on clinical evidence.

2. Co-operation between the medical and dental professions is necessary in order that conclusions may be reached with regard to the teeth which should be sacrificed.

3. The dentist should be discouraged from making promises with regard to the outcome of extractions.

4. The extraction of teeth by simply pulling is not adequate or justifiable.

5. The results from the extractions of teeth by the method known as alveolotomy should be encouraged with proper restrictions.

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#### DISCUSSION

DR. M. R. COULTER, Mankato: It was with pleasure that I listened to this paper by Dr. Gardner. His relation with the Mayo Clinic gives him an opportunity to watch and record results in these cases which he has been interested in as a diagnostician.

He brings out the fact which we as dentists have overlooked to a great extent, that of the x-ray as an aid in a diagnosis of a case with an edentulous mouth. Our former methods of extraction were far from adequate and we left many granulomas, and diseased tissue which continued to throw off their toxins. The big problem in our diagnosis is that of determining which teeth shall be extracted and which shall be left. A very few years ago findings at the Clinic at Rochester brought out the fact that in many diseases of the human body all pulpless teeth should be extracted. That all pulpless teeth should be extracted went as an edict broadcast over the land. A majority of the dentists did not allow themselves to swing to the extreme. Many of our medical brothers still believe this extreme and our patients are coming to us and wanting certain teeth extracted because they were so ordered by their physicians.

Now, from Dr. Gardner's paper comes the statement that "it is doubtless too radical at the present time to say that all pulpless teeth should be extracted." We admit that there are cases of low vitality because of certain forms of disease which call for extreme treatment, and in these cases the removal of all pulpless teeth need not be questioned.

The dentist realizes that the teeth serve an important function as an essential factor of the digestive process and the teeth are not to be indiscriminately sacrificed simply as a precautionary measure against possible systemic complications or merely as a step in the process of diagnosis by exclusion or elimination.

The co-operation between the medical and dental professions is becoming less strained, as they become better acquainted with the fact that the dentist is not only a worker in mechanics but that he understands the underlying structures and many of the diseases with which they may become infected. The dentist should be so trained that his judgment relative to the immediate extraction of

pulpless teeth should be considered. He should be discouraged from making promises with regard to the outcome of extraction.

I would add that you of the medical profession must heed the admonition as well. In preventive medicine our work as dentists will be very valuable. Careful prophylactic treatment, including the treatment of pyorrhea followed by proper mechanical restorations, will do much to encourage health in our patients.

DR. THOMAS B. HARTZELL, Minneapolis: It is, indeed, a pleasant privilege to be able to congratulate Dr. Gardner on one of the best papers that has been written this year. His admonitions and conclusions are certainly in line with the present day thought in the matter under discussion, and his desire that everybody who has dental disease should have a complete radiographic examination of the jaws is exactly right. Partial examinations are only misleading, and I would like to urge that in all cases, after removal of diseased teeth, checking up of the work by a radiograph is necessary, and I believe most men will agree in a short time that it is important and should be done. Certainly, I have followed that practice. In addition to a complete x-ray examination, emphasis should be placed on the fact that in co-operating with medical men the dentist should have a complete diagnosis handed him with his patient, so that he may use better judgment in handling the case during his own operative intervention. If a dentist is advised to extract teeth by the physician without knowing what the physical condition of the patient is, he must rely on his own judgment, and his judgment cannot be complete without a good foundation laid by himself or by the physician. If the physician does not hand him this advice with the patient, he is under the necessity of making the diagnosis himself. I have employed a technician for some years at considerable expense, and I operate on no case without a proper and complete examination.

In regard to removing bone from the labial surfaces of the teeth in making extractions, I know that it is done under proper restrictions. As I understand it, the idea now is that we will not sacrifice the alveolar process of the jaws any more than is absolutely necessary. I am absolutely in accord with that proposition. There has been a phrase amongst dental operators for some two or three years back to peel back the periosteum, to traumatize the tissues and remove so much of the alveolar process that many of these patients have been unable to wear artificial dentures. Anyone who is robbed of his masticating organs and cannot wear an artificial denture is in an unhappy, uncomfortable position. Dr. Gardner cautions us, and it pleases me, because it is a step in the right direction. We do not want to sacrifice the alveolar process of jaws of patients who must subsequently wear artificial dentures.

I can only repeat what I said in the beginning of the discussion, that this is a valuable contribution to dental and medical literature.

DR. BOYD S. GARDNER, Rochester (closing): With reference to the remarks of Dr. Coulter, I know very well that many dentists and physicians are under the impression that we are advising the extraction of all pulpless teeth and doubtless they have based their opinion on one or two of our dental reports. I would like to correct this impression. We advise the extraction of all pulpless teeth only



when certain systemic conditions are present. I am sure that anyone who has had access to our dental report since we have established a dental section in the Mayo Clinic will bear me out. In every patient we consider all pulpless teeth as questionable and advise further examination.

### OSTEOMYELITIS\*

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Osteomyelitis is acute suppurative of bone and is sometimes called "bone furunculosis." It is always caused by pyogenic organisms. Most commonly the staphylococcus pyogenes aureus is found; less frequently the albus. Others occasionally found are the streptococcus pyogenes, B. coli communis and B. typhosus. The staphylococcus aureus produces cases with the most severe local and general symptoms. The streptococci localize in the denser bone cortex, epiphyses or periosteum. Typhoid infection usually locates in the cortex or subperiosteally.

Probably all of the so-called spontaneous cases of osteomyelitis originate from a primary focus, known or unknown, which allows the pyogenic organisms to enter the blood stream and locate at a point of lowered resistance, where their growth may take place. Then our bone pathology begins. The infective embolus usually localizes in the end artery in the diaphysis of a long bone—most frequently the tibia, next in frequency the femur and then other long bones—producing a localized area of necrosis. Owing to the fact that it is within dense bone, the inflammation spreads rapidly along the medullary canal and also through the Haversian canals and soon forms a subperiosteal collection of inflammatory products, elevating the periosteum; and the cortical bone, robbed of both its internal and external blood supply, dies. The extent of this necrosis depends on the virulence of the infective agent and promptness and effectiveness of early treatment.

The bony repair is brought about from within by the endosteum and from without by the periosteum and as a result the necrotic original shaft is separated from the sound portions of shaft by a soft spongy bone which later becomes dense and hard like cortical bone. The areas of new endosteal bone may be irregularly distributed and enclose small purulent areas, resulting in small abscesses with-

in this new bone. The whole becomes surrounded by a shell of periosteal bone—the involucrum—attached at either end to the remnant of the original shaft.

In the very early stage an opening into the marrow may reveal no pus, two or three days elapsing before it appears. Later there may be pus with oil drops of fat from the marrow. The cortex at first is white and shiny and may show small red vascular spots; at a later stage it is white and opaque without luster; still later when separated as a sequestrum it is brownish. The periosteum at first may appear as a thin fibrous membrane, in a few weeks becoming thicker and crackling either under pressure from the fingers or when perforated by an instrument. This later becomes thick and hard like a shell of new bone and may attain the size of the original bone. Secondary changes in the tissue surrounding the bone lesion may be abscess formation or chronic thickening due to scar tissue which results in considerable enlargement of the limb.

The patient—and it most frequently occurs in young adults, half the cases being from thirteen to seventeen years of age—gives a history of having had an infected finger, a boil, a carbuncle, influenza, tonsillitis, some one of the exanthemata, typhoid fever, and then, following some exposure to cold or local injury over a long bone about the time he is getting well from his illness or infection, has a pain in the neighborhood of a joint. This pain may be severe and come on suddenly with high temperature and delirium, or it may come on gradually as an ache, or he may merely complain of a limp. In either case the pain, temperature, accelerated pulse rate and the general disturbances due to the absorption of infective material become rapidly more marked. In a short time, but not at first, there may be swelling over the neighboring joint without that joint being involved.

On examination this patient presents the appearance of a severe illness; in the severe cases he looks septic. There will be a moderate or marked increase in the leucocyte count. X-ray is rarely of much value early. Superficial palpation in the neighborhood of the pain may reveal no tenderness, but prolonged deep pressure directly over the lesion produces intolerable pain. This is the essential sign in early acute osteomyelitis.

Articular rheumatism is the diagnosis commonly made for osteomyelitis. J. B. Murphy used to say, "The case is typical of osteomyelitis with the added

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evidence that a diagnosis of rheumatism has been made." Articular rheumatism usually affects multiple joints and there is swelling in the joint early whereas in osteomyelitis the swelling as a rule is a later sign and the pain in osteomyelitis is peri-articular, not intra-articular. The point of greatest tenderness to *deep*, not superficial, pressure, is in the bone above or below the joint. Movement in the joint is not painful as in rheumatism. In gonorrheal rheumatism, which may be a mono-articular lesion, the history is of special importance. The onset of constitutional symptoms is usually less severe. Gonococci can usually be cultivated from the joint. Tuberculosis of bone begins in the epiphysis—osteomyelitis, in the diaphysis. Osteomyelitis shows symptoms of acute infection with acute onset, and a leucocytosis. Tuberculosis of the bone never incapacitates a patient in one to two days.

I believe I would urge at least an exploratory opening into the bone marrow in any case in which osteomyelitis is a possible consideration. The early drainage in these cases so materially shortens the course that such a diagnostic puncture would be justified. In early cases a skin incision over the point of greatest tenderness will permit an opening to be made through the cortex of hard bone to the marrow cavity. Pus may not appear for some little time. This opening need not be large. A gimlet will make a sufficient opening. It is possible, if this drainage is done early enough, to prevent destruction of bone and sequestrum formation. In later cases with swelling, pus may be encountered in the soft parts or the periosteum will be elevated and pus found under it. A wide enough incision to insure free drainage is necessary. This drainage *must extend to the marrow cavity*. Rubber tube drainage is preferable. In cases with extensive bone destruction, traction and support are necessary, for pathologic fracture is likely. From weeks to months following drainage, sequestrotomy is performed.

The separation of the dead bone or sequestrum from the living is a function of living bone. Until nature has definitely indicated the limits of the dead bone, it would be meddlesome surgery to attempt to remove it. The time for removal of the sequestrum may be after weeks or months. Keene divides this operation into the following three classes:

1. Removal of the sequestrum while the periosteal bone is still plastic. This would be applicable

in the tibia when the fibula acts as a splint. The average time is about the eighth week after the institution of drainage. The time is more accurately determined by examination of the periosteal layer, which should be about one-sixteenth of an inch thick and show definite ossification. This method has the advantage of overcoming the difficulty in filling up the central cavity as in those cases of late removal of the sequestrum. By an incision through the periosteal involucrum the necrotic shaft is exposed and excised through healthy bone. The edges of this periosteal bone are sutured, leaving a flattened tube, which forms the new shaft. A sterile dressing is applied and the limb placed in plaster of Paris. Repair is complete in from five to eight months.

2. Removal of the sequestrum when no accessory bone splint is present, as soon as there is sufficient involucrum to carry on the function of the original shaft. Roughly speaking this operation is performed in about twelve weeks or when the x-ray shows the thickness of the involucrum to be one-half the diameter of the original shaft. The involucrum is soft and vascular. The sequestrum should be thoroughly removed. In favorable cases the involucrum will fill the cavity left by the sequestrum in about the same time as in the periosteal operation. There is danger of both shortening and deformity in this operation.

3. In cases in which the entire shaft is destroyed, the safest way is to leave the sequestrum for months—six, ten, twelve months—until a complete involucrum is formed. Then by a sufficiently wide opening through this involucrum completely remove the sequestrum. The cavity is sometimes difficult to fill. The removal of sufficient involucrum so as to invert skin and fascia flaps and fasten them to the bone is perhaps the most satisfactory method of obliterating the cavity.

Two cases will serve to illustrate the amount of bone destruction as determined by the promptness or delay in early treatment.

The first case is K. J., male, aged 19, office worker. Had scarlet fever at eight years of age, otherwise always well. Is an only child of healthy parents. He scratched his right index finger on Feb. 14, 1920. It became infected, was incised and drained for from five to six weeks. About April 1, as the finger was about healed, he began to limp in the left leg. At night the leg would pain, preventing sleep. During the next two weeks he had a fever up to 104 with some nausea and vomiting, during which time he received osteopathic treatment.

When first seen April 15th, patient complained of pain in left thigh, which was better when perfectly quiet, except

that when asleep the muscles would contract, causing severe pain. His color was sallow. He had lost considerable weight. General examination was negative. Left thigh showed a conical swelling over middle third, extremely sensitive to deep pressure. Hip and knee joints were normal. Hemoglobin 65 per cent, temperature 99.6, pulse 96, W.B.C. 10,400. X-ray revealed an area of necrosis in the middle third of the shaft of the left femur.

April 19th, a lateral incision was made over middle third of the left thigh through periosteum and cortex, which was necrotic. Tube drainage was instituted. On April 21st there was evidence of pathological fracture at juncture middle and upper thirds of the femur with usual deformity in this location due to pull of the adductor and psoas muscles. The leg was placed in a Thomas splint in an abducted position, but in spite of both traction and forced abduction an angular deformity obtained. Free drainage was maintained; temperature and pulse became normal in about two months.

Feb. 17, 1921, under gas-ether anesthesia sequestromy was performed and a rough sequestrum 1.5 inches in diameter by 8 inches in length was removed. The upper end of the lower fragment of the femur was thoroughly curetted. A layer of muscle was loosened and brought into the space and sutured. Three drains were placed; upper drain was removed in four weeks. Drainage still persists from the lower end of the wound due to an area of necrosis still present. The patient is up on crutches; his general health is very good. Passive and active movements have softened up the thigh muscles. Flexion of knee obtains to an angle of 45 degrees. There is shortening of about 2 inches. This patient has been incapacitated for twenty months.

Contrast this case, treated late, with the following case in which treatment was instituted fairly early:

Second case, F. D., an eleven-year-old school boy, who has had chickenpox and measles, but otherwise was always well. The latter part of March, 1921, he fell and skinned his right knee. Pimples formed over the bruised area out of which pus was squeezed. During the next two to three weeks, there was much pain and fever, for the relief of which hot applications and osteopathy were employed.

He was first seen May 9th, when general and local signs pointed to an osteomyelitis of the right femur with almost as extensive bone destruction as the former case. This was immediately drained by deep incision. On May 13th patient complained of an ache in right shoulder and across his chest. He had some cough. His parents thought he had a cold. By evening the pain in the shoulder was severe. Temperature 104, pulse 120. There was an extremely painful area just below the right shoulder joint on prolonged pressure. W.B.C. 23,000. For some reason incision was delayed until morning, when there was some swelling over the shoulder. Incision through the deltoid, periosteum and cortex liberated a small amount of pus. This opening was drained with a tube.

November 2nd sequestromy was performed on both the right femur and the right humerus. From the humerus a small sequestrum about 1 inch in length was removed and the small cavity thoroughly cleaned out. This is already filling in.

In the first case there was a delay of about nine-

teen days following the onset of osteomyelitis before the femur was drained. In the second case there was a delay of twelve hours after the diagnosis was made.

In the first case almost the entire shaft of the femur was destroyed. In the second case a very small sequestrum resulted and the sequestrum formation might have been avoided by establishing drainage twelve hours earlier.

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#### DISCUSSION

DR. C. A. REED, Minneapolis: Dr. Allen has given us an excellent paper. I was particularly pleased with the stress he placed on the subject of idiopathic or hematogenous osteomyelitis. It might be said that diagnosis is almost the whole problem in acute osteomyelitis, while treatment is the problem in chronic osteomyelitis. The diagnosis must be made, ordinarily, by the general practitioner or pediatrician. They rarely ever get to the surgeon until the diagnosis is made. Although we are constantly warned to be on the lookout for this disease, it is often several days before it is recognized. In a recent report on thirty-nine cases in a metropolitan hospital, the average time before a diagnosis was made was eleven days. It is well for us to have this subject of acute osteomyelitis reviewed often, so that we may keep it constantly in mind.

I wish to call your attention to certain types of osteomyelitis in which the diagnosis is not so easy and simple.

First, there is a non-suppurative type which is quite rare. This may start as a very acute condition and yet never go on to suppuration. I have in mind a case of a fourteen-year-old boy who was taken very sick with high fever and pain in the region of the hip. He was not sent to the hospital for several weeks. When we first saw him, he had some pain in the hip but no local tenderness or limitation of motion. He was very septic and was running a high temperature. X-ray of the hip showed slight changes from the normal in the head of the femur. These changes became much more distinct in a couple of weeks and both the head of the femur and the hip joint were explored. No gross pathology was found and no growth from smears. Later, the x-ray showed the same condition in the clavicle. This became much enlarged and of a markedly honey-combed appearance. It never went on to suppuration. The temperature finally reached normal after a few weeks and the pain left.

Acute epiphysitis can at times cause confusion in diagnosis. A few weeks ago, I was sent a case with acute pain, temperature of 101 to 102 over a period of ten days to two weeks and swelling over the lower end of the femur. X-ray showed changes in the epiphysis. In this case, an opening was made through the lower end of shaft down into the epiphysis without opening the knee joint. The knee joint showed pus on aspiration. The joint was washed

out through an aspirating needle and the irrigation repeated in three days. The whole condition then cleared up.

Another condition which should be kept in mind is multiple osteomyelitis. This is especially confusing in a case which has been operated and which seems to develop a relapse. Everything seems to point to the fact that there is dammed up pus somewhere in the wound. It may turn out to be an infection of another bone.

DR. WILLIAM VON DER WEYER, St. Paul: I have enjoyed Dr. Allen's interesting paper, and think he has covered the subject quite thoroughly. I only wish to emphasize that early diagnosis and the institution of early operative procedure is essential: first, for the elimination of septic products, which are liable to cause a septicemia with serious consequences; second, for prevention of joint involvement and of bone destruction with its consequent deformity; and third, for the prevention of the development of a chronic osteomyelitis, which to my mind is one of the most difficult diseases with which the surgeon has to cope.

There is no doubt that diagnosis of the acute disease, at its most favorable period for treatment, is difficult, because of the usual proximity to the joint. The disease in children starts in the epiphysis and (1) it may remain as a simple epiphysitis or (2) it may go down into the medullary canal or (3) it may go about the epiphysis beneath the periosteum and (4) finally may go through the epiphysis into the joint. The important symptom is extreme local pain, experienced usually in the epiphyseal end of a long bone in children, especially on deep pressure with added general systemic symptoms, which condition warrants immediate operation. A wide open soft tissue incision down to the periosteum should be made, with one or several holes bored through into the medullary canal at the epiphyseal end of the bone or into the epiphysis for drainage. The bone structure here will be found to be soft. Pus may not be encountered, but when it is found, greater drainage is necessary and can be accomplished by removing a portion of the cortex of the area. Wick drains should then be lightly placed to the bone and gauze packs placed in the upper end of the wound in order to keep the soft tissues widely separated. Cleansing irrigations of either Dakin's or boric solution are valuable.

It is essential as a means of prevention against joint involvement, or, as an aid, should joint involvement already be present, to immobilize the limb by splints or by plaster of Paris casts.

X-rays show nothing in the acute stage, but give evidence of irregularity and changes in the epiphysis early. Later, it is very valuable in determining the formation of sequestrum and involucrum. I do not believe a sequestrum should be removed until it is entirely free. As most of these cases are in a rundown, anemic condition, it is advisable to institute, aside from the local, also a vigorous constitutional treatment.

DR. C. C. ALLEN, Austin (closing): I am glad Dr. Von Der Weyer went into more detail in regard to the drainage of these cases, and I am also glad Dr. Reed discussed a little more thoroughly the diagnosis of some of the more obscure types of bone lesions. My experience has been with the acute cases, although I have not been lucky in seeing them early.

In the second case in which there was metastatic infection, there was some oversight. I have forgotten whether there was objection on part of the parents or whether there was some hesitation on my part, but there was a delay in drainage of twelve hours. The important thing, as Dr. Reed suggested, is that in these acute cases, if seen and diagnosed at once, early drainage will materially shorten the course and the amount of bone destruction. We have all perhaps remembered more or less the course of these cases, but unless we continually review them, we will slip up on the early diagnosis, particularly at a time when it will do the patient the most good.

## PREMENOPAUSIC UTERINE PROLAPSE\*

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The many methods devised for the correction of the pathologic conditions under consideration certainly merit a review, with the understanding that, while nothing new will be added, certain fundamentals will be emphasized, that we may arrive more nearly at a standard of perfection.

When the organs of reproduction have passed the period of procreation, and have ceased to function, we have then to deal with a pathologic entity, which frequently taxes the skill of the surgeon to its utmost. Some of our cases will return with a secondary procidentia.

The interposition operation (Watkins<sup>1</sup>, Wertheim<sup>2</sup>) is the one most frequently done, providing the uterus is firm, the best results being obtained at or about the climacteric period. When the uterus is atrophied, or soft, one may resort to an abdominal hysterectomy, including the ovaries and tubes in the removal, anchoring the cervix to the broad and round ligaments. The Murphy modification of the Kocher<sup>3</sup> operation has proven very satisfactory in this type of cases. In the cases where none of the above mentioned methods are advisable, the "vagina-pelvic fixation operation (Mayo<sup>4</sup>) is the most satisfactory method.

In dealing with a prolapse during the premenopausal period, when the organs of reproduction are still active, our problem is vastly more complex. It is then not alone necessary to conserve the function of reproduction, but we must repair the pathologic condition, in order that we may correct the disturbed circulation which normally supplies the uterus and ovaries, thereby re-establishing the chemistry of the internal secretions. The endocrines

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unquestionably play an important role in the general welfare of the patients.

*Etiologic Factors of Prolapse.*—One encounters a greatly varied condition of prolapse. The uterus begins to descend when the levator-ani muscle, sacro-uterine, and pubo-cervical ligaments have given way, allowing a constant dragging on the broad ligaments, which finally become stretched to such an extent that a complete procidentia results. If the body of the uterus is retained by its broad ligament attachments, the cervical portion of the uterus may become elongated, frequently passing well beyond the vaginal outlet, carrying with it the cystic wall, and giving all the symptoms of complete prolapse.

The uterus, in its normal position, is moved in a somewhat circular path in the plane of the broad ligaments. The round ligaments act as supports to keep the body of the uterus from traveling beyond this circular plane. The pubo-cervical fascia, or ligaments, act as a fulcrum, while the levator-ani and sacro-uterine, guide the cervix and limit its motion. The direction of travel of the uterus is very easily demonstrated by carrying it backward with an ordinary dressing forceps through a bivalve speculum in the vagina.

We know, clinically, that laceration of the perineum itself is not always productive of prolapse. Many a woman who has borne children and has been lacerated, is going about with no more trouble than a rectocele. However, lacerations, or relaxations, of the pubo-uterine fascia will invariably result in prolapse of the bladder and the uterus. The most frequent causes assigned to this condition are rapid succession of child-birth, and the improper application of forceps. These are contributing factors producing this pathology, through laceration and relaxation of the pelvic outlet.

The true etiology begins with the developing young woman when the bony structure of the pelvis is passing through the period of adolescence. It constitutes the greatest factor in our pathology of women during the child-bearing period. Mothers, always proud of the physical development of their sons, have little concern for the development of their daughters. They little realize its importance to them in their future welfare. Our public playgrounds and gymnasiums are as essential for the girls as they are for the boys, for the real mother of tomorrow should be the athletic girl of today.

Lacerations of the supports of the pelvis during

child-birth are the results of contractions of the bony pelvic outlet. The relationship in the dimensions of the anterior and posterior segments of the sagittal line, to the transverse diameter of the outlet, will decide whether the head will be delivered at the expense of the anterior supporting structure, or of the posterior structures of the outlet. When the head, at birth, is directed against the posterior support and lacerations ensue, the separation will be productive of a rectocele. A deflection of the head toward the anterior segment, with the resultant laceration of the fulcrum of the uterus, will produce a cystocele and prolapse.

*Disturbances of Circulation.*—The blood supply of the organs of reproduction comes chiefly from the uterine which branches from the internal iliac artery, and the ovarian, branching from the aorta just above its bifurcation. These blood vessels anastomose frequently, and are remarkable for their tortuous course. They reach the various organs through the broad ligaments.

From the study of Sampson<sup>5</sup> on the potential supply of blood to the ovary, we learn that the actual blood supply is both ovarian and uterine. The fallopian tubes and uterus are both supplied from the same source. The veins of these organs are unusually large. When women have borne children and have suffered lacerations because of a defective pelvic outlet, with a resultant prolapse, many of the symptoms complained of are produced through disturbances of circulation in the pelvic organs. A prolapsed uterus may produce symptoms of backache, frequency of micturition, a feeling of pressure, and abdominal pain, with tenderness upon examination, which is produced through the venous congestion of these pelvic organs through traction upon the broad ligaments. The cardiac impulse sends the blood through the anastomosing arterial vessels, but the venous circulation becomes retarded, and the uterus becomes engorged and heavy.

The interference in the circulation of the ovary is productive of cystic degeneration and disturbances of the internal secretions, making neurasthenics of many women. Temporary relief may be afforded through replacement and support of the uterus by a pessary, until the circulation becomes re-established and the congestion is reduced.

*Treatment of Prolapse During the Childbearing Period.*—The use of the pessary must be condemned for the treatment of these conditions, except as previously mentioned, for a temporary support of



the uterus, and for the reestablishment of the uterine circulation.

In considering the conservative methods of treatment, we must be certain that we are dealing with a fairly normal uterus. Any pathologic condition which would lead to later complications, such as multiple fibromata, suspicion of malignancy, or periuterine inflammation with metro-rhagia, necessitates a more radical surgical measure.

We have learned that the various suspension operations so frequently practiced a few years back, were of no permanent value. The ventro-suspension and ventro-fixation methods of repair have no further value than a pessary would have, for they act only as temporary supports. The shortening of the round ligaments, whether internal, such as the Gilliam, or the external, as originated by Alexander, retains the body of the uterus within its plane, but offers no support. The external operation should be the operation of choice when it is necessary to shorten the ligaments. The internal operation is often followed by pelvic distress.

The importance of the cervix as an adjunct in the support of the body of the uterus in the proper plane, is not generally recognized. The high amputation so often practiced immediately makes the ligaments of the body of the uterus the supporting structure, and the function of the utero-sacral ligaments is destroyed. In amputating an elongated cervix, we must recognize the importance of a surface of sufficient length remaining to act as a support beneath the pelvic floor, which is the real support. Avoid amputation too near the internal os.

Perineal restoration is necessary, no matter what method is followed for the repair of prolapse. The approximation of the mesial edges of the levator-ani muscles is essential for its success.

The proper repair of the anterior supporting ligaments is frequently overlooked, for we have concern only for the cystocele. Unless the uterus is firmly fixed at this point, we shall fail in our efforts to repair. The imbrication of the fibromuscular tissue forming the base of the broad ligaments on the anterior surface of the uterus will give a satisfactory result.

By making a T-shaped incision in the anterior vaginal wall, and dissecting the flap backward by blunt gauze dissection, separating the bladder from the uterus as high as is necessary to expose the bases of the broad ligaments, the fibromuscular tissue may be approximated in the median line with a continuous catgut suture. When the point of

fixation is established, the bladder is carried up with a flat retractor, and the operation is completed with the suturing of the vaginal flaps. It may be necessary to shorten the round ligaments in order to carry the body of the uterus above the newly constructed bridge.

Prolapse of the uterus, during the premenopausal period, must be so treated that the child-bearing function will not be destroyed. This condition should be corrected so that the circulation may be restored, thus enabling the internal secretions to properly function, protecting women from a state of semi-invalidism.

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#### NONTUBERCULOUS INFECTION OF THE LUNGS\*

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I have selected for this review twenty-eight cases of nontuberculous infection of the lungs in which accurate data have been compiled. This number was chosen from a larger series of cases observed in the Mayo Clinic during the period from March, 1920, to December, 1921. This condition has ordinarily been diagnosed clinically as pulmonary tuberculosis or bronchitis. Various authors have named the condition: a lobar type of bronchopneumonia<sup>20</sup>, a localized subacute form of bronchopneumonia<sup>12</sup>, chronic progressive influenza<sup>13</sup>, and, nontuberculous lung infection<sup>6,7,9</sup>. I shall report three cases in detail as illustrative of the findings in my twenty-eight cases.

#### REPORT OF CASES

CASE 1 (A309858). Mrs. O. P. S., aged thirty years, came to the Clinic in March, 1920. The patient had had diphtheria at twenty years, recurrent attacks of tonsillitis, and, in November, 1918, she was in bed three weeks with influenza. During this illness she developed a cough which persisted to the time of examination here. Coughing, which was most persistent in the morning, was more severe during winter and inclement weather and when she was harboring slight infections, such as a "cold," to which she was easily subject. The sputum consisted of a yellowish material and was never profuse. Examination of the sputum

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elsewhere had failed to reveal bacilli of tuberculosis and a diagnosis of chronic bronchitis had been made.

Examination revealed the blood pressure to be 120 systolic and 70 diastolic; the pulse rate was 72 and the temperature varied from 99 to 98.6. Moist râles were noted at the bases of both lungs, especially abundant on the left. Roentgenograms of the chest showed bronchial infiltration in the right upper lobe, suspicious for tuberculosis. The tonsils were shown to be fibrous with some plugs. The fingers were not clubbed. She was given creosote inhalations with beechwood creosote internally.

The patient was re-examined September 15, 1921. The cough had continued persistent, as much as a quarter of a tablespoonful of yellow pus being raised at one time. Her condition was much the same as at her previous examination and her general health had not depreciated.

Examination of the sputum was negative for bacilli of tuberculosis. Diagnosis was made of chronic bronchitis with nontuberculous infection of the lung, especially in the left base, and very slight bronchiectasis.

CASE 2 (A372663). Miss H. B. aged sixteen years, came to the Clinic September 20, 1921, complaining of chronic cough, impaired hearing for five years, and a feeling of being tired. She had had pneumonia in 1909, 1915, and 1918, tonsillitis in 1916, and influenza in 1919. The tonsils and adenoids had been removed in 1920. During her first attack of pneumonia she was very ill in bed for two weeks, following which she developed a chronic cough with expectoration of a yellowish material and a discharge from the nose which persisted to the time of examination here. In 1915 and again in 1918, she developed pneumonia, in 1915 following an attack of measles. During the last two years the cough had become nonproductive until just previous to examination here, when she again began expectorating yellowish material. Expectoration did not reach a maximum at any particular time. The patient "caught cold" easily. There had been no loss of weight, no night sweats, hoarseness, pleurisy, or dyspnea. For a period of six weeks in 1920 she had marked malaise, slight fever, and some loss in appetite and strength. Since childhood she had had severe frontal headaches which came on without cause and were accompanied by a cessation of the nasal secretion. The headaches subsided when the nasal secretions again began to flow.

Examination revealed a rather dull appearing girl with nasal obstruction and snuffles. Her temperature ranged from 98.4 to 99 and the pulse rate varied from 116 to 108. The blood pressure was 112 systolic and 78 diastolic. The fingers were not clubbed. Examination of the heart was negative. On inversion and cough only a small amount of sputum was recovered. There were a few scattered moist râles, but at a later examination on prolonged inversion a moderate number of moist râles were heard in the right base. Examination of the sputum was persistently negative for bacilli of tuberculosis. Sphenoid sinusitis and bilateral maxillary sinusitis were present. The blood showed hemoglobin 65 per cent, 12,800 leukocytes, and 3,910,000 erythrocytes. Roentgenograms of the chest revealed apparently healed tuberculosis of both upper lobes.

Diagnosis was nontuberculous infection of the lung with mild bronchiectasis. The patient was treated by inversion four times a day with beechwood creosote inhalations and beechwood creosote internally. The disease of the sinuses

was cared for surgically. Observation has not been sufficiently extended to warrant a statement of the results.

CASE 3 (A292384). Mrs. E. M. aged twenty-eight years, came to the Clinic April 10, 1920, complaining of persistent cough and pain in the right thoracic region following an attack of influenza. She had had pneumonia three times, influenza, pleurisy, infection of the antrum, and tonsillitis. The cough developed slowly with gradually increasing severity and frequency, was more troublesome in the morning, and was aggravated by change of position. Sputum, which was expectorated mostly in the morning, was yellowish, rather profuse, and occasionally streaked with blood; there were no frank hemorrhages at any time. Examination of the sputum elsewhere had been negative for bacilli of tuberculosis. There had been some loss of weight, strength, and appetite, and a slight fever. She had had severe pleurisy in the left side of the chest during the attack of influenza and had complained of pain in this region for ten years. There had been some shortness of breath, not asthmatic in type. She had always "caught cold" easily and had had marked nasal catarrh. Her ability to work had been interfered with, but she did not go to bed.

Examination revealed the pulse rate to be 96, temperature 99.4, systolic blood pressure 118 and diastolic blood pressure 78. The fingers were not clubbed. There were abundant moist râles in the right base. Roentgenograms of the chest indicated old tuberculosis in the right apex; roentgenograms of the sinuses were negative. Examination of the nose and throat did not reveal evidence of disease.

The patient was re-examined in December, 1920. She said that the cough had improved when she went home and that expectoration had been slight until six weeks before, when she took cold. Since then, cough and expectoration had been marked. The pain in the left chest had almost subsided. At examination, the area at the left base still showed some evidence of the old condition, but it seemed to be much improved. The cough had entirely subsided by November, 1921.

#### MAYO CLINIC SERIES

*Seasonal incidence.*—In most of our cases the disease developed during the colder months; sixteen cases developed during the period from October to April, while only six developed from May to September. The others were indefinite as to time of onset.

*Geographical location.*—The fact that only three of our patients lived in the South may be of significance, although unquestionably the larger percentage of our registrants come from the North.

*Family history.*—There was a family history of tuberculosis in eight of our cases, while a similar cough was present in another member of the family in six instances; but only once did I see two patients from the same family. Miller reports in two instances two cases from the same family. Field reports one such instance. In the cases cited by Miller one followed the other, thus indicating direct contagion.

*Previous disease.*—In most instances the infection followed an acute cold, influenza, or pneumonia. A tendency to "catch cold" easily was quite marked and occurred in twenty-two of our cases. Of minor significance were whooping-cough, measles, scarlet fever, pleurisy, simple grippe, croup, and childbirth.

*Accompanying diseases.*—Twenty-one patients complained of nasal catarrh, and thirteen showed various nasal abnormalities at examination. Adenoids were noted in only one case, probably because nearly all the patients were adults. Definite sinus disease was found in six of our cases, while in eight there was a history of previous sinus disease. Field states that sinus disease was present in three of his eight cases. Some degree of tonsillitis was found in eight of our cases, and in three others the tonsils had been removed previous to examination here.

*Deformity of the chest.*—Thoracic deformity was mentioned in only one of our cases, while Field did not find this condition in any of his reported cases.

*Bacteriology.*—*Bacillus tuberculosis* was absent in all cases in this series and those in the literature. In eleven of our cases the sputum had not been examined previously, while in seventeen it had been found negative for tuberculosis. In 1902, Lord<sup>12</sup> reported twenty-nine cases in which there were cough and purulent expectoration. Eighteen of these cases were chronic. He studied 100 unselected cases of cough bacteriologically, and was able to demonstrate bacilli of influenza in more or less pure culture in these twenty-nine. Many of his cases were of a type usually classified as chronic bronchitis or tuberculosis. Some of his cases are unquestionably identical with ours. Lord<sup>17</sup> reported further studies in these cases in 1905. Hamman and Wolman, who dealt with a series of twelve cases practically identical with ours, found that the pneumococcus was most often predominant, next the bacillus of influenza, and lastly the streptococcus. Garvin, Lyall, and Morita, who dealt with eight such cases, found the bacillus of influenza in seven of the eight, predominating in four, and secondary in three. Miller, who reported twenty-two cases which he divided into subacute, subacute with exacerbations, and chronic, found pneumococcus Type IV predominating in ten, the bacillus of influenza in eight, and *Streptococcus viridans* in three. In his seven chronic cases alone, those which correspond to the Mayo Clinic series, the pneumococcus Type IV predominated in four, *Streptococcus viri-*

*dans* in two, and bacillus of influenza in one; in one case pneumococcus Type IV was predominant in one culture, but a later culture showed predominance of the bacillus of influenza. In Field's cases the bacillus of influenza was predominant in one, *Streptococcus pyogenes* in three, and *Staphylococcus albus* in four. Bossert and Leichtentritt report twenty-four cases which they call "chronic progressive influenza." Their cases resemble ours in some respects. The bacillus of influenza predominated in all their cases. Recently, Greely and Brereton reported cultures of *Aspergillus fumigatus*, *Mucor corymbifer*, and *Penicillium glaucum* obtained from non-tuberculous infections in the lung, but they apparently were not dealing with the type of case reported in my series. No attempt was made toward a systematic bacteriologic study of our cases, but in those cultured, the pneumococcus Type IV, *Streptococcus viridans*, *Streptococcus hemolyticus*, and *Micrococcus catarrhalis* were found predominant. *Aspergillus* was cultivated from one specimen of sputum. Herbst, Elliott, Radin, Hawes, Niles, Lyter, and Butler have also observed similar cases.

*Age and sex.*—The twenty-eight patients comprising this series ranged from ten to seventy-five years of age with an average age of thirty-nine and seventenths years. The disease began in three of Field's eight cases before the age of six; two patients developed the condition at thirteen and three at twenty. Four of Miller's seven patients whose condition was chronic were more than thirty. Riesman reported seven cases which, however, were of the subacute rather than the chronic variety. His patients were between six and nineteen. Larrabee's cases, in symptoms, signs, and location of the lesion, resembled those of Riesman. The patients varied in age from ten to seventy-five years. From the literature and from our own cases, it may be assumed that the chronic type of case occurs oftener in advanced life, the subacute type oftener in earlier life.

Our cases are almost equally divided as to sex, thirteen males and fifteen females. In Miller's series of twenty-two patients, including all types of cases, there were eight males and fourteen females, while in the seven chronic cases the sexes were more equally divided.

*Pathology.*—There has been no opportunity in our cases to study the pathology, since none of the patients are known to be dead. Necropsy was performed in one case of Hamman and Wolman; the bronchi of both lower lobes were dilated and filled

with purulent material, and around the dilated bronchi were scattered areas of bronchopneumonia. Lord<sup>13</sup> examined at necropsy one case of forty-four years' duration in which there was slight generalized bronchiectasis with many small areas of interstitial pneumonia. Judging from the physical signs, one would usually expect to find localized bronchitis and bronchiolitis with some dilatation surrounded by small areas of bronchopneumonia and fibrosis, but not sufficient to give signs of consolidation or to produce a good shadow in roentgenogram.

#### SYMPTOMS

*Cough.*—By far the most common symptoms are expectoration and cough over a prolonged period, both occurring either constantly or in attacks lasting a number of days, weeks, or months. All but two of our cases presented these symptoms. In the majority of cases cough was most marked on arising and sometimes on retiring, while paroxysms of cough on stooping, such as are often seen in bronchiectasis, occurred in only a few instances. In most cases the cough was chronic but increased in severity in the winter. The influence of climate has been variable, only four of our nine patients who moved to a milder climate noticed any benefit.

*Expectoration.*—The sputum was usually mucopurulent, yellow or yellowish green, and either small or considerable in amount. However, large amounts were not expectorated at one time, as in bronchiectasis. Sometimes the sputum was streaked with blood and in six of our cases there was definite hemoptysis; in one case as much as a quart of blood was said to be expectorated. In only three cases was the sputum described as of foul odor, while in four others slight odor was noted. It was not of the thin consistency of the sputum of frank cases of bronchiectasis and did not settle into layers on standing.

*Pleurisy.*—Fourteen of our patients gave histories of so-called pleuritic attacks, but these were not by any means always typical. The complaint of indefinite pains in the chest was not uncommon.

*Constitutional symptoms.*—As a rule there was very little fever. In the twelve patients with histories of fever it usually occurred for a period of a few days, coinciding with an acute "cold," with the symptoms of acute coryza, and with an exacerbation of the cough. In one of our cases almost the only complaint was recurrent attacks of fever with little or no cough or expectoration. An area

in the left base near the angle of the scapula presented the typical physical signs of the disease under discussion. Riesman emphasized the idea that this type of infection may be the cause of obscure fever. Twenty of our patients had symptoms sufficient at times to interfere with work; eleven were at times confined to bed.

A history of chills or chilly sensations was given in nine of our cases. Some loss of weight was noted in fifteen, decrease of appetite in sixteen, decrease of strength and energy in nineteen, and night sweats in ten. Usually, none of these symptoms were marked and the patients usually appeared in good general health.

*Asthma.*—Asthmatic symptoms, sometimes slight, usually not characteristic, occurred in six of our cases, while some dyspnea on exertion was present in nine.

#### CLINICAL EXAMINATION

The general appearance of the patient was usually good, but sometimes there was a mild anemia, as shown in five of our cases. Some patients had slight curvature of the nails, somewhat resembling the "watch crystal" nails of bronchiectasis or other pulmonary suppuration, but I have not seen any instances of clubbed fingers, which is so prominent a feature in the picture of bronchiectasis.

Inspection of the chest usually produced nothing suggestive, although lessened expansion of the portion involved sometimes occurred or occasionally a poor or absent Litten's sign on the affected side. The physical signs were located in the right base in eight cases, in the left base in six, in both bases in eight, and in the entire right lung and base of left lung in one. They were fairly well generalized in four cases and the location was not stated in one.

The principal feature of the physical examination was the presence of more or less abundant moist râles, sometimes accompanied by sibilant and sonorous râles. The râles were present mostly during inspiration, sometimes only on deep inspiration, and were often increased by cough or the "expiration-cough-inspiration" method of bringing out râles in cases of tuberculosis. Such râles were present at some time during observation in all of our patients. Occasionally, the râles may be heard over the whole of one lung and often occur in "showers." Sometimes the râles may be brought out by examination after the patient has been in the inverted position for a few minutes, that is, with the head much lower than the hips. Dimin-

ished resonance is noted in some of the cases while in others there is no change in the percussion note. Harsh or diminished breath sounds occurred in some of the cases, but true bronchial breathing and the associated signs of consolidation did not appear. Dyspnea at examination was not noted in any considerable number of our cases. Cyanosis was not observed.

The temperature at examination varied from 98° to 101.8°, the pulse from 60 to 130, with an average of 91. The blood pressure in adults varied from 98 to 200 systolic, averaging 127, and from 56 to 104 diastolic, averaging 69.

A leukocyte count from 9,000 to 14,500 was found in twelve of our cases, while a count of 6,000 or less was found in seven. The remainder of the cases were within the normal limits of 6,000 to 9,000.

*Roentgen ray.*—In most of our cases the roentgenograms were reported negative. Tuberculosis in one or both upper lobes was reported in several instances. Miller found some increase in the pulmonary markings in six of the seven chronic cases. In none of our cases were the roentgen-ray signs of tuberculosis shown in the area presenting the physical signs. In several cases, however, tuberculosis was diagnosed roentgenographically in another area which did not agree with the physical and bacteriologic examination.

In ten instances the patient was not cognizant of a diagnosis previous to our examination; in eleven the diagnosis was chronic bronchitis and in three tuberculosis, and in none of the cases in which a diagnosis of tuberculosis had been made did we find a roentgen-ray evidence of the disease.

#### DIAGNOSIS

The chief points in the diagnosis of nontuberculous infection of the lungs are: (1) Cough for a prolonged period either constant or with exacerbations; (2) little depreciation of general health; (3) little, if any, fever and if present, intermittent; (4) lack of progression of the disease; (5) the lesion usually located in the base of the lung, and (6) absence of bacilli of tuberculosis in the sputum.

#### DIFFERENTIAL DIAGNOSIS

Nontuberculous infection of the lungs may be distinguished from tuberculous infection mainly by the location of the lesion in the base, by the less marked or absent depreciation in health, by lack of progression, and by the absence of bacilli of tuberculosis. Often there is leukocytosis. In at

least nine of ten cases of tuberculosis the infection is found in the upper lobes or apices, while almost the reverse is true of these cases. Recently Rosenblatt reported that in 1,000 cases of tuberculosis only three were primarily in the base of the lung. Seventeen of eighteen patients presenting basilar lesions admitted to the Bedford Hill sanitarium with the diagnosis of tuberculosis were found to be nontuberculous. In this connection, it is well to remember the dictum of Brown that "Abnormal physical signs at one apex should be considered as due to pulmonary tuberculosis until proved not to be; while those at the base should be looked upon as not tuberculous until definitely proved so."

Nontuberculous infection of the lungs is differentiated from simple chronic bronchitis by the fact that chronic bronchitis is usually generalized, is often secondary to cardiac or other disease, has less tendency to the production of purulent sputum, usually does not cause exacerbation of symptoms with temperature, and usually produces no leukocytosis. Moreover, in simple bronchitis the râles are predominantly dry, while in this condition they are predominantly moist.

Bronchiectasis may usually be distinguished from nontuberculous infection of the lungs by clubbed fingers and more abundant foul sputum brought up by paroxysms of cough. Cough and expectoration are usually markedly affected by changes of position, such as lying and stooping. The cough in bronchiectasis is typically loose and a copious amount of the sputum can usually be produced by inversion. On standing, the sputum often separates into three layers. There is usually no leukocytosis in bronchiectasis.

Bronchopneumonia is usually bilateral, acute, and not recurrent, while this condition is chronic, often unilateral, and recurrent. In bronchopneumonia there are usually some signs of consolidation, while in this condition such evidence is usually absent.

#### PROGNOSIS

In adults the prognosis must be very guarded, as it is likely that the condition will persist or recur. It seems quite probable that most of these patients will develop a true bronchiectasis if the infection persists. In children the prognosis is somewhat better, according to most authors, although I have not had much experience with such cases.

#### TREATMENT

Garvin, Lyall, and Morita were the first to emphasize the value of postural treatment, by inver-



sion of the body at least four times daily for a ten or fifteen minute period. This may be done by the patient's kneeling on a chair with the hands on the floor, by assuming the Trendelenburg or reversed Trendelenburg position, or even by hanging the body over the edge of the bed. The more nearly the patient assumes the perpendicular inverted position, the better the drainage usually is. Most of our patients were given steam inhalations with creosote or benzoin two to four times daily; in some instances beechwood creosote was given internally as well. General hygienic measures such as open air, sunlight, appropriate diet, and moderate exercise should be instituted.

#### CONCLUSIONS

1. Nontuberculous infection of the lung is a nonspecific disease which, however, deserves a name as a separate disease entity.
2. The essential features are cough, marked chronicity, exacerbations, little or no fever, and few other constitutional symptoms, usually purulent expectoration, lack of progression, and location of the lesion almost always in bases.
3. The principal physical sign is moist râles.
4. Diagnosis is made mainly by chronicity of cough, little effect on general health, location of signs in bases, and persistent absence of bacilli of tuberculosis.
5. In the differential diagnosis chronic bronchitis, tuberculosis, frank bronchiectasis, and bronchopneumonia must be considered.
6. Prognosis must be guarded in adults.
7. Treatment is mainly by posture.

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#### EXPERIENCES IN THE FEEDING OF WHOLE LACTIC MILK IN CERTAIN CONDITIONS OF INFANCY\*

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The feeding of whole milk which has been acted upon by lactic acid bacilli has been used by medical men in various conditions for a considerable period. In the last few years it has been used rather extensively by some in the treatment of certain feeding conditions of infancy. Probably one of the most enthusiastic of its advocates is Marriott of St. Louis. While working in the St. Louis Children's Hospital I had occasion to see the effects of its administration in a considerable variety of conditions and was impressed with its good results in many cases. During the last six months, while associated in the practice of pediatrics with Dr. O. W. Rowe in Du-

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luth, I have used it in a series of cases both in the hospital and the home with a large degree of success, these cases forming the basis of this paper.

The most important action that the lactic acid bacillus brings about when added to milk, is to increase the acidity of the milk, which in turn aids digestion. This is explained by Marriott<sup>1</sup> as follows:

"Cow's milk differs from human milk in that it has a higher 'buffer' value. By 'buffer value' is meant the capacity to unite with relatively large amounts of acid or alkali without a great change in chemical reaction. If the same amount of hydrochloric acid is added to equal volumes of human milk and of cow's milk, it is found that the acidity of human milk expressed in terms of hydrogen ion concentration is far greater.

"When milk enters the stomach of a normal infant, gastric juice is secreted in such an amount that the stomach contents ultimately reach a certain degree of acidity; this degree is the optimum concentration of acid for rennin action and is sufficient to markedly inhibit bacterial growth. The presence of acid on the gastric side of the pylorus initiates a reflex which allows for passage of the food into the duodenum. Here the acid acts on some substance in the mucous membrane, which results in the production of the hormone, secretin, a substance capable of stimulating pancreatic and biliary secretion. Such is the normal course of events when the infant is fed on breast milk.

"Suppose, however, that the infant is fed cow's milk instead of breast milk. If the same amount of gastric juice is secreted it is entirely insufficient to render the stomach contents acid to anywhere near the same optimum degree; in fact, at least three times as much hydrochloric acid is required as in the case with human milk. We must therefore assume that the stomach secretes three times as much acid or else that the optimum acidity is not reached. To secrete this amount is probably beyond the functional capacity of certain infants; yet, if this amount is not secreted, bacterial inhibition and rennin action in the stomach occurs to only a slight degree. Without the passage of a sufficiently acid chyme into the duodenum, secretin formation and the hormone stimulation of the pancreatic and biliary secretion would necessarily be greatly diminished.

"In the light of these conditions is it any wonder that certain infants fail to thrive on cow's milk that

has been insufficiently diluted? It is interesting to note that those foods which have been found to be the best tolerated by malnourished infants are those which have a low 'buffer' value or in which the buffer is already partly neutralized by acid. Breast milk, well diluted cow's milk with added carbohydrate, lactic acid milk, and protein milk are examples."

In addition to the above action, the lactic acid milk is of value in that the bacilli outgrow and thus do away with a considerable number of other organisms, pathogenic to normal digestion, found in ordinary cow's milk. It cannot be said, however, to outgrow other bacteria in the intestinal canal or to completely change the flora there. The presence of the bacilli alters the milk only in the increased amount of acid present (about 0.5%) without in any way changing its food value.

This type of milk is usually prescribed much as an ordinary whole milk formula would be, using milk, water or cereal water, and sugar. The sugar which I have used has been given in the form of Karo syrup. This is used because of its high percentage of dextrin (dextrin 55%, maltose 30%, glucose 15%), the dextrin not being readily fermented and thus only mildly laxative. It can, in my experience, often be safely added in amounts considerably over the customary total seven per cent carbohydrates, and makes a cheap, easily obtainable sugar. The syrup is usually first diluted with an equal amount of water to facilitate its easier mixture into the formula. The cereal water used has been either oatmeal or barley water.

Stock cultures or tablets of bacillus *Bulgaricus*, obtainable at most druggists', are the source of our bacilli. They must, however, be fresh; the various companies usually date their period of usefulness on the bottle. I have been using the liquid suspension most of the time, though the tablets are reputed to be equally good.

Preparation of the whole lactic milk formula is a comparatively simple procedure, though entailing a little more work than the preparation of an ordinary milk mixture. Mothers, on the whole, complain little of it. The directions for home preparation are much as follows:

To the designated amount of whole milk in the formula prescribed, previously boiled and cooled to a temperature of 100°, is added one teaspoonful of liquid suspension of Bulgarian bacillus; the whole is then mixed well. This is set aside for

from twelve to twenty-four hours, an equable temperature of 100° being maintained. The limits of safety are 90°-120°. This degree of heat is kept by mothers in various ways, chief among which are setting behind the furnace or stove, wrapping in blankets and hot water bottles, or the use of a vacuum bottle. At the end of this period the soured milk is stirred up with a beater and forced through a strainer several times. The sugar, in the form of 50 per cent Karo syrup, is mixed with the diluent; this in turn is added to the milk, and the whole well mixed, divided into the specified number of bottles, stoppered, and put on ice till feeding time. The individual bottles are warmed to 100° before feeding, care being taken not to overheat, as coagulation may take place. It should be well shaken before and during the feeding. The hole in the nipple may have to be enlarged. We have encountered little difficulty in having mothers prepare this food, provided they are given explicit written instructions.

Children fed on a correctly prescribed formula, prepared as above, usually do well. It, like other feedings, is, however, far from being a cure-all and has, of course, its limitations. The infant usually rapidly acquires a taste for the new food and, after the first few days, likes it very well. He does not tire of it readily, and can be fed on it for an indefinite length of time. I have fed two children such a food for six months and several for four months, who have developed into exceptionally strong, hardy, happy babies. Of course, the ordinary additions to the diet must be made at the proper ages, namely: fruit juice, cereals, and vegetables. Under these circumstances rickets, in my experience, occurs with no more frequency than on ordinary whole milk dilutions. We have several times been struck by the noticeably firm feel of these infants. The stools usually number one to four daily, are brownish grey or yellowish, have a consistency of thick salve, with a sour, not unpleasant odor; in fact, they are typical soap stools.

My series includes about twenty cases, both in and outside of the hospital. They have all been, in some degree, feeding disorders. Normal babies do well on it. The conditions in which it was used are as follows:

1. Athrepsia (atrophy, marasmus)..... 8 cases
2. Athrepsia associated with and due to pylorospasm ..... 2 cases
3. Intestinal indigestion where other feedings were not well handled..... 1 case

4. Prematures or new-borns where breast milk was not available ..... 5 cases
5. Recovery from debilitating infectious disease such as ileo-colitis..... 2 cases
6. Miscellaneous cases ..... 4 cases

I have found it very valuable in athreptic babies because of the higher percentages of whole milk in a formula that can be given at any age. I have at times been able to give over 200 calories per kilo of body weight because of this factor. Most of my cases came under this class, and all responded favorably when their individual caloric requirements were determined. They gained satisfactorily, and the general improvement was marked. Formulas begun in the hospital were practically always continued when the child was taken home (frequently out of town) with continuation of the improvement, as the records will show. The following is a fairly characteristic case:

*Case 1:* S. C. No. 26022. In hospital 33 days. Two and one-half months old on entrance. Weight 4110 gm. Athreptic. Offered first a whole milk modification; gained only 100 gm. in 11 days. Changed to whole lactic milk formula; gained 440 gms. in 22 days. Sent home. Family conditions rather poor, but continued to do well. The weight at six and one-half months being 7600 gms.—a gain of 2060 gms. in two months, and the baby in excellent condition. Continued on the whole lactic milk mixture at home. Progress continued satisfactorily.

In athrepsia due to pylorospasm the whole lactic milk was mixed with varying amounts of thick barley gruel (another modification of the Sauer thick cereal feeding). The barley paste was first prepared and then added to the whole lactic milk, after its preparation. Such a formula might perhaps be:

Whole lactic milk .....	540.
Water .....	360.
Karo syrup, 50 per cent.....	60.
Barley flour .....	125.

Five feedings daily of 180 gms. each.

The following is such a case:

*Case 2:* V. T. No. 25652. In hospital for 34 days. Four months old on entrance. Weight 3770 gm. Athreptic. Marked stomach peristalsis and vomiting. Gained 950 gm. in 34 days in spite of numerous acute and chronic ailments. Not seen after discharge but heard from—gained 2310 gms. in two months, and did well on mixture. Later changed to whole milk formula and thick cereal gruel reduced.

Three cases of prematurity were offered this food. One of these children was fed it for seven months; its history follows:

*Case 3:* M. S. Weight on entrance 2150 gms. Gained for a time on a whole milk mixture; then held weight for 12 days. Fed whole lactic milk mixture for 7 months. Gained 3790 gms. in spite of an attack of erysipelas of

face, back and arms, lasting two weeks, and three periods of nasal infections with fever. A good firm baby the final result.

One case in which ordinary feeding was inductive to colic, gas, frequent stools, yielded good results:

*Case 4:* E. L. No. 22538. In hospital four days. Had previously been fed breast milk and complement of whole milk mixture. Result—gas, colic and distention. Gained 330 gms. in four days on breast and whole lactic milk complement, with relief of symptoms. Kept on this for two months; gained five and one-half pounds in this time. General condition excellent. Later changed to whole milk mixture, and did well.

It was fed in two cases during debilitating diseases such as follows:

*Case 5:* C. L. No. 26041. In hospital twice; diagnosis enteritis, bronchitis, perirectal abscess, rickets. Fed protein milk for a short time, then whole lactic milk mixture. Lost weight steadily during a febrile period due to the formation of a perirectal abscess. Stool always remained good. On opening of abscess gained 400 gms. within 6 days. Sent home. Had an upset, due to poor home conditions and ignorance. Returned to hospital five days later, put on same food, gained 270 gms. within 4 days. Discharged. Not heard from later.

In view of the uniformly good results obtained with this type of feeding, I feel that there is a considerable field in which it may be successfully used and in which it will give results superior to any other artificial food. Its greatest value, to my mind, can be realized in the treatment of athrepsia and its associated conditions.

#### A RESUME OF PARTIAL RECTAL PROLAPSE WITH A SUGGESTION AS TO TREATMENT\*

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It is with some hesitation that I present this paper dealing with partial rectal prolapse, knowing as I do that the method which is to be described will probably not be acceptable to many physicians. However, for the past five years the method has been tried and found satisfactory in my hands, so I present it for what it is worth. The results have been excellent and sepsis, infection or other disagreeable complications have been noticeable by their absence.

The type of prolapse referred to in this paper is that in which only the mucous membrane is involved and where the muscular coat remains in its accustomed position. I always think of the rec-

tum as similar to a silk lined kid glove, the leather portion of the glove being the muscular coat and the silk lining the mucous membrane. The connection between these two coats is not very secure, they being held together by the blood vessels and nerves which pierce them and a small amount of connective tissue. Nature, however, by placing the rectum somewhat upon a slant and by projecting Houston's valves into its lumen has made it much more difficult for play to develop between the two coats than were the rectum a straight cylinder lying perpendicularly in the body. However, despite nature's forethought there is considerable room for movement between the two coats and indeed a certain amount is necessary.

If, for any of the well known reasons such as diarrhea, constipation, hemorrhoids, etc., the strain upon the mucous membrane becomes great, it begins to slip down a little with each strain or defecation. Each time it slips the play between the two coats becomes a little greater and unless it be promptly checked a noticeable prolapse soon results. This protrusion may vary from a slight fold which appears during the act of defecation and promptly returns as soon as the act is completed, to a protrusion of two or three inches which must be replaced manually, or, in extreme cases, where the sphincters are thinned and exhausted the protrusion may be constant. Partial prolapse is the most common type seen in infants and children. As many of these cases may be relieved by proper medical and dietary treatment, they are cared for by the pediatricians and hence do not present themselves to the proctologist. In adults, however, medical treatment is usually of no avail and it is necessary to take more energetic measures.

In carefully going over the literature on this subject it would appear that all the operations described utilize one of three fundamental principles:

1. The narrowing of the anal outlet, as the passing of a silver wire around the anus.
2. The resection of the protruding mucous membrane.
3. The fixation of the mucous to the muscular coat. All of these methods have produced cures, at least in the hands of their exponents, but they are not of equal value.

The first method or the narrowing of the anal outlet I do not believe fulfills either the proper surgical or anatomical principles and there is little excuse for its use. All that is accomplished by

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this procedure is to stuff the prolapsed mucous membrane back into the rectum and then by narrowing the opening to try to prevent it from prolapsing again. In children, whose tissues are elastic, this much help may in time enable the mucous and muscular coats to assume their normal relations. Indeed, most of the permanent cures recorded by this method are in children where careful dietary and medical treatment will often produce a cure without operative procedure. In older persons, whose growth is complete and whose tissues are more rigid, less elastic and have less reparative power, the narrowing simply holds a bunch of redundant mucous membrane out of sight in the lower part of the rectum and so prevents proper bowel movements. If for any reason the anal orifice becomes a little more patent, the mucous membrane is there, ready to prolapse again. The only place where it would seem that this procedure would be of service is where there is a marked relaxation of the sphincters. Here a narrowing of the outlet may be advisable as an adjunct to other operative procedures, but in no sense a cure in itself.

The second method or the resection of the prolapsed mucous membrane is not a proper method to employ as a curative measure. If a cuff be removed the mucous membrane above is still loose and will soon slide down, causing a recurrence. A number of fancy flap operations have been devised as modifications of the simple cuff operations and, while they may be somewhat better, the principle is wrong. Some of these operations do produce cures but in my opinion their success lies not in the fact that the protruding mucous membrane has been removed but rather that the operation has produced sufficient adhesions to prevent further prolapse. If no adhesions are produced, later recurrence is almost certain.

The third principle is that of anchoring or fixation of the mucous to the muscular coat and is the only method where there is an attempt to restore the parts to their normal relations and hence the only one which is anatomically correct. Since the prolapsus results from insufficient attachment between the mucous and muscular coats, any method which will bind them securely together will give an anatomical as well as symptomatic cure. It is true that in a few cases in old people where there is a constant protrusion of a large amount of mucous membrane through a relaxed and gaping sphincter, a resection of a portion of this mass and

a narrowing of the anus may assist in producing a cure. Even in these cases it is surprising how often the anus will contract down and the sphincter regain its tone if the mucous membrane be returned inside the rectum, fixation produced by the method to be described, and the patient be kept in bed for a few days.

The most common methods employed for producing the required adhesions is that of linear cauterization. This is usually done by the use of a caustic or the actual cautery, from four to six longitudinal burns being made over the prolapsed area. These burns must be deep enough so that the tissue underlying the mucous membrane is involved, otherwise sufficient scar formation will not occur. It is usually advised that the lines of cauterization be carried down through the anal canal. This method requires either a general or extensive local anesthesia, as pain is usually marked. A slough always occurs if the attempt is to be successful.

By the use of submucous injections of quinine urea hydrochloride this method can be greatly simplified, pain dispensed with and practically all cases treated as ambulatory patients. Further than this, I feel that the drug is much more under the control of the physician than where nitric acid or the actual cautery is used. The method as the one just described is based on the principle of the fixation of the mucous to the muscular coat and is very simply and easily executed.

The patient is placed in a Sims or squatting position and then by straining and manipulation the exact extent of the prolapse is determined. The patient is now placed in the knee chest position for treatment. An anoscope is introduced and with the inrush of air the mucous membrane flattens out over the muscular coat in approximately its normal relations, leaving practically no folds. Four sites are now selected equidistant around the circumference of the bowel and carefully cleansed with peroxide, iodine and alcohol. The distance of these sites from the anus depends upon the extent of the prolapsus. In the average case a point a little above the hemorrhoidal area is taken. At each of these sites from five to ten minims of 5 per cent quinine urea hydrochloride are injected into the space between the mucous and muscular coats. The patient is then allowed to lie down for a few minutes and is then ready to leave the office. It is necessary that the bowels be kept soft and straining prevented, and for this, liquid petrolatum is given in sufficient quantity. The treatment is

repeated every fifth to seventh day until a cure is effected. The action produced by quinine urea hydrochloride of this strength is the same as anywhere else in the body, namely the calling forth of a fibrino-plastic exudate which is later partially absorbed and partially replaced by dense scar tissue which binds the two coats together.

As has been stated there are a few cases where there is a large amount of mucous membrane constantly prolapsed and the sphincters thinned and relaxed where a preliminary resection may be advisable. It is surprising, though, how many cases, in which upon first examination this would seem the procedure of choice, will respond to the simpler treatment if, after the first injection, the patient be kept in bed for a few days with the buttocks strapped.

There may be some who will question whether this method will actually produce a cure. I can only say that it has done so in my hands and I believe that it will do so in the hands of anyone who will give it a thorough trial. In principle the treatment is correct, namely, to restore the mucous lining of the bowel to its proper anatomical relation and fix it in that position. Any procedure which does not give an anatomical as well as symptomatic cure cannot be accepted as ideal. Though it is granted that this method be more tedious I believe that the technique described in this paper will give a larger percentage of good results than any other one method and with less pain and greater satisfaction to the patient.

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#### DISCUSSION ON THE PAPERS OF DRS. W. A. FANSLER AND L. A. BUIE

DR. ROOD TAYLOR, Minneapolis: As a pediatrician I have had a very small experience in rectal polypi. I do not think, however, that they occur with any great frequency in childhood. I cannot recall, during my time at Rochester at the Mayo Clinic, that I ever saw one, and we have had only one case in the Abbott Hospital in the last three years. Partial prolapse of the rectum does occur very frequently. One reason possibly for its frequent occurrence in childhood is that the rectum in children lies more nearly vertical than in later life. However, partial prolapse of the rectum is nearly always secondary to and most frequently is the result of diarrhea; second, to constipation, and third, to general muscular weakness and relaxation, so that its treatment is the treatment of the cause of the constipation, the cause of the diarrhea, or the general bodily weakness. I have seen only one case which required surgical attention.

Dr. J. C. Masson, Rochester: I was much interested in both of these papers, but I have a feeling that this is a subject not very well understood by the men engaged in general practice and in general surgery, and that a great many cases are inadequately or incorrectly treated.

A great many of the cases of prolapse of the rectum are incomplete, and proper handling in the early stages would prevent the more serious condition which often entails a serious operation.

I have had little experience with such cases in children in recent years, and I am glad to hear that this treatment promises so much. Most of the cases of partial prolapse in children can be cured by regulation of the bowels. I have observed a few cases associated with hemorrhoids, and the treatment has been along the line suggested in the first paper, by cauterization. In treating ordinary prolapse of the rectum, which is associated with hemorrhoids, we have resorted to free linear cauterization, removing the pile mass and a certain amount of the mucous membrane by cauterizing well up into the prolapsed area. The rectal mucous membrane retracts to its normal position and becomes adhered in that position. Thorough dilatation of the rectum and the avoidance of movements of the bowel for five days is important.

Dr. Buie is to be congratulated on his instrument. No doubt there is no class of cases which we regret to see more than carcinoma of the rectum. The operation for this is very serious and patients are slow to consent to it. In many cases it means an artificial anus. It is probable that in a large number of cases the carcinoma of the rectum started from polyps which were originally benign. If it is a single polyp, with a small pedicle, removal such as Dr. Buie suggests means a minor operation and a safe one for the patient. With the older treatment it meant laparotomy, opening the sigmoid, and exposing the peritoneal cavity to possible infection; and the operation is almost as danger-

ous as resection. Of course, polyps with sessile bases will probably have to be treated in much the same manner for some time, but we hope with the advent of this instrument others will be stimulated to produce an instrument so that tumors with larger bases can be handled.

Dr. Buie did not refer to the great field that it opens to the surgeon in the cure of cases of multiple polyposis involving not only the rectum but the sigmoid. If, for example, multiple small polyps in the rectum, or close to the rectosigmoidal junction, can be treated individually, resection of the diseased part can be carried out and the lumen of the bowel be established. At present the treatment in such cases is the same as that for carcinoma, which means destroying the lumen of the bowel and leaving the patient with an artificial anus.

DR. W. A. FANSLER, Minneapolis (closing the discussion on his part): I heartily endorse what Dr. Masson has said about Dr. Buie's instrument. It is a really valuable contribution to the equipment of the proctocologist. It is an instrument with which we are going to save a great many lives by avoiding serious operations when patients can be cared for by the simpler method he has outlined.

As to my own paper, cauterization is certainly one of the operations of choice, and where there is some complicating condition, such as hemorrhoids, it should be done. I am simply offering a less radical procedure in cases that are uncomplicated.

DR. L. A. BUIE, Rochester (closing): Cancer of the rectum is, perhaps, the result of polyposis in many instances. There is a tendency, almost constant, for adenomatous polyps to degenerate. This is so true that I think these tumors should be considered potentially malignant in all instances and should be taken out, if possible. Dr. Masson has suggested the use of the clamp in removing multiple polypi from the bowel through the proctoscope. It would seem that there might be a possibility for the use of this method along the lines used in the treatment of ulcerative colitis.

In this latter disease, we treat the lower sigmoid and rectum hoping to heal it with the idea of excluding the colon and doing an ileosigmoidostomy. With the same thought, it might be possible to remove polypi from the lower sigmoid and rectum in cases of extensive multiple polyposis and exclude the colon, or do a colectomy and bring the ileum down to the sigmoid or rectum.

I think Dr. Fansler's idea concerning the treatment of prolapse should be given a trial. Quinine and urea has been used as an injection in the treatment of hemorrhoids ever since Dr. Terrell, of Richmond, Virginia, wrote concerning his experience with it, in 1914. Its value is based on the fact that the solution causes fibrosis around the veins. A great deal has been written which bespeaks the value of this method. This is sufficient evidence of the logic of Dr. Fansler's thought in using these injections in trying to establish a fibrosis beneath the rectal mucous membrane.

When we see the unsatisfactory results which so frequently have come from the numerous other treatments of prolapse of the rectum, very often by drastic surgical procedures, it is certain that so simple a procedure as Dr. Fansler has described should be given a fair trial.

## THE PUERPERIUM FROM THE STANDPOINT OF THE NEUROPSYCHIATRIST\*

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"A woman is a woman," says Virchow, "because of her ovaries." Berman<sup>1</sup> tells us that at birth there are from 30,000 to 200,000 ova in the safe deposit vaults of the ovary and of these only about 400 mature between the ages of fifteen and forty-five. Puberty will be calm or stormy according to the manner in which the ductless glands react to the eruption of the ovary. Modern feminism is not only withdrawing more and more of the best women from marriage and motherhood but it is developing masculinity; and the stress and strain of the new social order inhibits maternal instinct, causes menstrual disorders and makes for sterility.

The change occurring at puberty and adolescence in the evolution of the organism and those incident to involution at the climacteric, while of great and far reaching significance, are entirely overshadowed by those taking place in pregnancy. It is the time of somatic testing. "Pregnancy is the time among the internal secretions of a great uprooting and stirring of fundamental and cataclysmic changes in the most intimate chemistry of the cells" (Berman). The profound tides of the hormones centering around the new creative being of the womb transfigures the face and constitution of the child-bearing woman. This remarkable change associated with maternity, Berman aptly illustrates by a quotation from *Main Street*—"I do not look lovely, Mrs. Bogar," says the heroine, "my complexion is rotten, my hair is coming out, and I look like a potato bag, and I think my arches are falling—and the whole business is a confounded nuisance of a biological process." By some the placenta is regarded as a ductless gland which influences the internal secretions of both mother and child.

Maternity is beset with countless fears; dominant among these is the dread with which the life instinct views the approaching ordeal and the natural shrinking from the inevitable pain incident to confinement. Forty years ago, Dr. A. J. Stone, always a pioneer, used chloroform to relieve needless suffering; immediately there was directed against him

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<sup>1</sup>The Glands Regulating Personality, Lewis Berman, M. D.

a cruel and absurd propaganda that he was guilty of a wicked and irreligious act, for did not the primal curse say "that in pain thou shalt bring forth thy children"? The following case of Buzzard illustrates the disturbing influence of fear. An immaculate spinster of 47 years had for months been agonized by fear that she was about to give birth to a child; inquiry revealed that she was not even aware of the steps necessary for such a fear to be realized.

The affections incident to the puerperium from the standpoint of neuropsychiatry are: localized traumatic neuritis due to the pressure of the head, obstetrical palsies, the cerebral palsies of childhood, neurasthenia, hysteria, Korsakoff's syndrome and the psychoses. Obstetrical palsies are due to manipulations during labor. A loosely hanging arm or an atrophied shoulder in a child or infant indicates a birth paralysis; it may occur unilaterally or bilaterally, and is not of uncommon occurrence. It is likely to improve as the child grows older. Cerebral palsy due to subdural hemorrhage means usually paralysis, spasticity, idiocy and life-long helplessness; if the symptoms of shock, convulsions and paralysis are recognized, surgery may achieve one of its most brilliant successes. Talleyrand once remarked that speech was given to man in order to disguise his thoughts; while this may be true of diplomacy, it is equally so of any discussion of neurasthenia and hysteria. Beard's conception of the former and Charcot's of the latter, not many years ago generally accepted, are now archaic. Both these diseases are a symptom-complex, not a distinct clinical and pathological entity. Parasitic, like Spanish moss, they can grow on any tree. They are the neurotic fringe of an unstable nervous system. In neurasthenia, basically we find a nervous constitutional inferiority, the neurasthenic syndrome being caused by exhaustion, faulty metabolism, endocrine unbalance, psychic stress, focal and acute infections. In pregnancy, Dr. Paramore believes that neurasthenia depends to a great extent on a depressed intra-abdominal pressure due to emptying the uterus. If this theory is true, says Buzzard, every woman bearing a child should become neurasthenic and in the case of twins she should become insane. Hysteria is a disease of the subconscious. Psychopathology has relegated the classical forms of Charcot, spinal concussion and traumatic neuroses to the medical scrap heap. The Korsakoff syndrome and its asso-

ciated neuritis may occur during pregnancy. It is caused by the toxemia arising from many diverse pathological states. As to the nature and toxicity of the offending toxins we are absolutely ignorant.

If ocular manifestations occur in the first six months of pregnancy, associated with violent headaches, gestation should be immediately terminated. Death may result from neuritis. The prognosis depends on the severity of the process and the conditions under which the disease originates. Recovery may be a matter of months—sometimes years. Patients who have suffered from pernicious vomiting and other toxic symptoms should be cautioned to avoid future pregnancies.

You will recall the story of the man who wrote a book on "The Natural History of Ireland," one chapter of which treated of "The Snakes" and consisted of three words—"There are none"; following this writer, I can remark, *there are no insanities peculiar to the puerperium*; they differ in no way from those occurring in the non-pregnant state and like them depend on a neurodegenerative taint. "The puerperal psychoses," writes Dr. Adolph Myer, "are very much the same as outside of the puerperium. As in surgical problems, occasionally cases respond with more or less unaccountable delirium. The conditions with which we deal are very largely a climax of accumulated tension, and it is very remarkable how often one finds suspicion of infidelity, reactions to inferiority feelings, probably due to a loss of attractiveness and states of perplexity. During lactation schizophrenic symptoms may arise based on the constitutional make-up, dread of renewed pregnancies, etc. Langdon well says that "it is the patient, not the parturition that determines the type of the mental disorder." Pregnant women do become insane—one in every four hundred; any form of mental disease can occur at this time. Thackeray's wife developed dementia precox after her third confinement. Dementia in pregnancy is rare; its occurrence signifies that an unrecognized or a latent precox patient has become pregnant or that a latent paresis has become active as a result of the pregnancy. Pregnancy in neurotic women after the thirty-second year, or long intervals between children (Craig) or late pregnancies (Dercum) are liable to develop psychoses. In some women the birth of a male child is associated with a psychosis while that of a female is attended with no ill effects. (Craig.) Disturbance of consciousness at the beginning of labor indicates



grave sepsis or eclampsia (Klix). Coincident with conception some women manifest a change of character or disposition; they become depressed, irritable and suffer from insomnia; these symptoms being invariably present the patient makes her own diagnosis. A prior psychosis does not necessarily mean its recurrence during the parturient period. Dercum states that one of his manic-depressive cases is nearer normal during pregnancy than at any other time. When predisposition obtains, the insanity usually occurs early, less frequently at full time and during lactation (Paton). Insanity before quickening frequently recovers at that time; after this it lasts through and usually long after delivery. Neither induction of premature labor nor normal delivery relieves the mental symptoms. Women who have suffered from a psychosis, when they again become pregnant, usually become terrified and consult their physician in great trepidation. A few words of encouragement dispell their fears. In my personal cases there has not been a recurrence or any ill effects.

The descriptions of the older writers of the manic-confusional state designated as puerperal mania is one of the most dramatic characterizations of all medicine. Slight emphasis was placed on infection, on neurodegenerative taint none; the malignant trinity of causes were hemorrhage, exhaustion and mental strain; especially stressed was the shame and worry of illegitimacy; graphically they pictured the patient, conscience-stricken and terrified in her wild delirium, slowly counting the hours of her assignation.

Mental disorders occurring during the puerperium are usually divided into three classes:

1. The insanity of pregnancy (11.38 per cent)—that is any insanity manifesting itself before confinement.

2. Manic-confusional insanity (46.4 per cent)—improperly called puerperal insanity. Mental disturbance developing within six weeks after labor falls under this head; broadly speaking, if it occurs within two weeks after parturition it is a mania; later a melancholia. Fürstner's acute hallucinatory insanity of parturition I believe should be included here. One should speak of the *insanities* of this period, for in addition there may occur acute mania, dementia precox or paresis differing in no way from the same insanities in the non-pregnant state.

3. Lactational insanity (42.18 per cent, Hoche). This arbitrarily includes any mental disorder appearing six weeks or more after delivery.

The insanity of pregnancy and lactation is usually a melancholia—the depressive phase of manic-depressive insanity. Excitement associated with mental confusion and hallucinations constitutes the manic-confusional type.

Manic-confusional insanity heads the list, followed by lactational and the insanity of pregnancy. The latter is rare and not invariably a depression. It may be a dementia precox. This sometimes occurs in interrupted stages, each corresponding to a period of pregnancy (Defursac). Melancholia is characterized by depression, self-accusation, constantly worrying because of personal wrong-doing, not that of some one else as in precox, sluggish mental reflexes and suicidal impulses. In lactational insanity the breasts secrete a hormone, which tends to inhibit the ovary and thus prevents an imposition of pregnancy during lactation, an unfortunate happening for mother, infant or embryo (Berman). Dementia, either of precox or paresis, is a parturient coincidence more or less camouflaged by the condition under which it arises. The unsystematized, fragmentary and unrelated delusions, the hallucinations, the delirium and the clinical picture of manic-confusional insanity suggest a toxic cause. It is a delirium and not a mania; often this is of a low muttering type; there may be a dry tongue and sordes form on lips and teeth. Paton calls attention to the fact that fever and local septic processes are not always parallel phenomena with psychic disturbances. The onset is acute: the patient becomes restless, sleeps badly, is suspicious, develops an aversion to the child; she may commit infanticide; she is at first talkative, then noisy, shouting and singing, develops hallucinations, refuses all nourishment, is destructive of clothing, mentally confused, incoherent and disoriented. Generally there is an elevation of temperature varying from 100 to 101 degrees; the lochia becomes offensive, scanty, then ceases; the milk dries up. In only one other disease—paresis—is the excitement equally acute. A wild maniacal outburst may occur at the period of crowning during which the mother may kill the child. The manic confusional type is by no means limited to the puerperium. Exhaustion, alcohol, kidney disease, sepsis, etc., are common causes. The manic-depressive form occurring in the puerperium is liable to recur. Clouston observed in one patient five recurrences with an ultimate recovery; each attack accentuates the neurodegenerative taint and militates against recovery. Dr. Earl Bond reports a

striking case where a true manic state developed after a first baby with recovery in six months, after a second baby with recovery in six months, and after an operation for amputation of the uterine cervix, also with recovery in eight months.

Persistent insomnia during any period of pregnancy should be regarded with concern, especially in a neurotic primipara; either sleep must be secured or instrumental delivery resorted to (Craig). Insane patients do not react to pain as a normal person does and the nurse must be on the watch for retention of urine, varicose veins and edema. An acutely insane woman may not complain of labor pains.

The manic-depressive type occurring during the puerperium generally recovers, with much the same symptoms, says Bond; one case may recover promptly and the other subside into a dementia. In the manic-confusional form, if the patient does not die from exhaustion, recoveries occur in 80 per

cent of the cases in from three months to a year; if infection does not take place and mental stress is negligible there need be no recurrence. Insanity of lactation is usually of long duration. Every melancholia is a potential suicide and according to Langdon every puerperal woman a potential infanticide. The removal of the infant is imperative until after recovery. Only the mildest forms can be cared for in the home; hospital environment is indispensable. Morphine and chloral of a former day has been replaced by rest, elimination, isolation and over-feeding. In these patients food is a surpassingly good hypnotic.

Note: The quotations from Dr. Adolph Meyer, The Johns Hopkins Hospital, and Dr. Earl D. Bond, Department for Mental and Nervous Diseases, Pennsylvania Hospital, were personal communications. I am also indebted to Dr. F. W. Langdon's address before the Obstetrical Society of Cincinnati, for valuable suggestions.

# MINNESOTA MEDICINE

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June, 1922.

No. 6

## EDITORIAL

### State Medical Meeting—Minneapolis

Attention is called to the change in date set for the annual meeting of the Minnesota State Medical Association to be held in Minneapolis in the fall. The Council of the Association has changed the date to Thursday, Friday and Saturday, October 12, 13 and 14, 1922, the scientific program to occupy Friday and Saturday. This change was made to avoid conflicting with the annual meeting of the Mississippi Valley Medical Association, which is scheduled to meet at Rochester, Minnesota, this year, October 9-12 inclusive. This change in date will enable visiting physicians at Rochester to attend the State meeting at Minneapolis, the two days following.

Early notification of the program committee regarding the presentation of papers at the State meeting is important and an effort is being made to have a representative program from the entire state. The program committee feels that the annual meeting of the State Association offers the opportunity for Associate members primarily to present medical subjects before their confreres and a long list of outside speakers is not contemplated.

The program committee for 1922 is as follows:

### Medical Section

Dr. J. G. Cross, chairman, Donaldson Bldg., Minneapolis.

Dr. David M. Berkman, Secretary, Mayo Clinic, Rochester.

### Surgical Section

Dr. E. K. Green, chairman, 808 Physicians and Surgeons Bldg., Minneapolis.

Dr. E. M. Jones, Secretary, 1014 Lowry Bldg., St. Paul.

### Goiter Prevention

In the early days such as those described by Wells in the opening chapters of his History of the World, iodine was undoubtedly well distributed throughout the earth.

Through the action of natural forces, the readily soluble sodium iodide, which is the salt of iodine commonly found, has been washed down into the sea which now seems to be its chief source. Through action of air and spray from the sea, nearby vegetation contains iodine and animal life near the sea coast obtains sufficient iodine for normal thyroid metabolism.

On the contrary, regions such as Switzerland, the Great Lakes basin and the Cascade Mountain region are practically devoid of iodine and are well known as goiter districts. Minnesota has its share. The water of mountain districts is entirely lacking in iodine. It is interesting to note the great increase of the incidence of goiter in Vienna after the late Austrian emperor Franz Joseph presented the city with a mountain water supply. Seattle, Portland and Tacoma are said to have shown a similar increase as a result of receiving their water supply from the Cascade mountains.

Up to fifty years ago commercial table salt was procured from the ocean and contained iodine salts. Now, thorough refining processes have resulted in the elimination of the iodine from salt of sea origin. Salt from inland sources, such as the Great Salt Lake contains no iodine. All these factors have resulted in eliminating iodine in large measure from human diet.

Animals and fish are subject to goiters as well as man—or shall we say woman. Land-locked salmon are known to develop goiters. Back in 1909, Marine and Lenhart prevented goiter in trout by the addition of iodine to the water in the ratio of one to a million parts.

The work of American investigators—Marine and his co-workers in particular—has called attention to the value of the addition of iodine to the diet and they have proven the practical application of iodine administration for the prevention and cure of goiter by the addition of almost homeopathic doses.

In 1917 Marine and Kimball\* began extensive experiments on the school children of Akron, Ohio, and in brief the result of two and a half years' observation showed that only five goiters developed in some 2,190 pupils who were given a grain of sodium iodide over a period of ten days twice a year, while 495 goiters developed in some 7,320 cases who were not given the iodine. Observation showed, too, that this administration of iodine reduced roughly five times as many goiters as occurred in control cases not given iodine.

Klinger of Zurich reported a similar experience. The goiter incidence was reduced in 760 children from 90 per cent to 28 per cent in fifteen months by the administration of 10 to 15 mg. of iodine weekly. He also reported that thyroid enlargement in both the fetus and pregnant mother can be prevented by the administration of two grams of sodium iodide during the first half of pregnancy.

We venture to predict that the time is close at hand when iodine will be given almost universally in this country, particularly in goiterous districts. School children in the grammar school grades need it most for the adolescent goiter so common in young girls is most apt to occur from puberty on. It is a simple matter to give minute amounts of the sodium salt in sweet chocolate or wafers.

Perhaps the simplest method of iodine administration is the addition of minute quantities of sodium iodide (1 mg. NaI to 15 grams NaCl.) to the table salt and without doubt a special brand of iodized table salt will be forthcoming on the market.

A note of warning should be sounded. Although no case of exophthalmic goiter developed in either Marine or Klinger's series, iodine is absolutely contraindicated in the exophthalmic variety of goiter. It is well established that care should be taken in the administration of iodine to adults with goiters that are suspected of being hyperactive. There is likely to be a rush for iodized salt or iodine in some form by individuals afflicted

with goiter and the profession will have to take care in advocating the use of iodine in the prevention of goiter to lay proper emphasis on its contraindication in cases of overactive goiters.

### Intra-Rectal Medication

It is safe to say that the average physician consigns to the wastepaper basket the great majority of circular letters received daily from the various commercial houses which call to his attention the wonderful therapeutic value of new remedies with hyphenated trade names, coined in many instances to favor greater sales.

One received in the morning mail did not receive the usual fate at once because the apparent plausibility of its contention only made it the more insidious and dangerous. The letter head was quite impressive and indicated the international character of the firm and its activities. A quotation rightly calls the physician's attention to the importance of correct and up to date treatment of syphilis, if he is to avoid losing prestige. He is then told that *the newest and safest treatment of syphilis is by the intra-rectal method*. One is reminded that quotations, if irrelevantly chosen, may lead to most absurd conclusions; for instance, "Then Judas \* \* went away and hanged himself." "Go thou and do likewise."

Our Council on Pharmacy and Chemistry has investigated the question of the rectal administration of arsphenamine and has concluded there is "a lack of evidence for the efficiency of this method of arsphenamine administration." We as practitioners are not going to abandon the well established efficient intravenous method for an easier and in all probability worthless method of medication with this particular remedy.

Intra-rectal medication has its place. There is no more satisfactory route for the administration of salicylates in acute rheumatic arthritis. The same applies to certain other drugs. The slower absorption prolongs the action of the drug and the poorer absorption necessitates roughly double the oral dose.

It is only necessary to call the attention of the profession to this insidious advertising and surely the opinion of the members of our Council on Pharmacy and Chemistry who are physicians should be accepted in preference to judgment so often warped by the influence of the almighty dollar.

\*Marine, David and Kimball, O. P.: The Prevention of Simple Goitre in Man. A. M. A. Jour., Vol. 77, No. 14.



## COMMUNICATIONS

Dr. Carl B. Drake,  
Secretary, Minnesota State Medical Association,  
1235 Lowry Bldg., St. Paul, Ramsey Co., Minn.  
Dear Dr. Drake:

The State Board of Health, at its meeting, January 10, 1922, provided for State Advisory Board on Maternal and Infant Hygiene, consisting originally of seven members, now increased to nine, as follows:

1. Dr. L. D. Coffman, President, University of Minnesota.
2. Miss Caroline Crosby, Board of Control.
3. Mrs. J. R. Brandrup, Mankato.
4. Miss Marguerite Wells, President, League of Women Voters.
5. Mrs. John Friedeman, Minn. State Registered Nurses' Association.
6. Mrs. M. F. Ernst, Secretary, State Parent-Teachers' Association.
7. Dr. F. L. Adair, State Medical Society.
8. Dr. N. O. Pearce, Northwestern Pediatric Society.
9. Dr. Wm. F. Wild, Executive Secretary, Minn. Public Health Association.

The duties of this Board are:

1. To suggest rules and regulations for adoption by State Boards of Health as authorized under Chapter 392, Session Laws of 1921, to carry into effect the provisions of this Act.

2. To pass upon plans of County or District Boards on Maternal and Infant Hygiene.

3. To advise the State Board of Health what assistance be given to county or district boards whose plans are approved.

4. To secure co-operative action through the various agencies represented by the members of the board in carrying out the provisions of the Federal and State laws on maternal and infant hygiene and to promote the public health and child welfare program in Minnesota.

The Board also provided for county administrative boards with membership of five. It was found, upon checking the membership for the counties throughout the state as originally outlined, that in a few counties there would be only one or no woman member on the Board. At a meeting of the State Advisory Board, April 21, this matter was discussed thoroughly, and finally, by unanimous vote, it was recommended that the State Board of Health provide for a County Administrative Board of five members, at least two to be women, with three set members, as follows:

- (1) County health officer;
- (2) County commissioner (the one who is on the Child Welfare Board, if any, in county);
- (3) Physician to be selected by County or District Medical Society and appointed by the State Board of Health as the medical members of county sanatoria commissions are appointed.

\* \* \* \* \*

The State Board of Health, and also the members of the Advisory Board, are firmly of the opinion that the success of the maternal and infant hygiene work will depend upon the attitude of the state, district and county societies, and of the individual physicians practicing medicine in Minnesota. It is the desire of the State Board of

Health to get in touch with all the medical organizations and with the individual physicians and satisfy them that the work will be conducted so that the best interests of the medical profession, as well as those of the general public, will be assured. Not only the plan for the work, but the details in carrying out the plan, will be explained fully to the physicians, and the greatest care will be used to keep them informed so that they will know that they are considered as the most important of all the various workers interested in maternal and infant hygiene.

Today I have received a letter from the Director of the Children's Bureau, Washington, in answer to one sent April 29 with the certification of the State Treasurer for the 5,000 gift from the Minnesota Public Health Association. It is necessary to revise these papers and to make up the budget including new items since certain questions raised in my letter, by authority of the Board, were answered favorably in a general way. Briefly, these questions related to the matching by federal funds of money used in State Board of Health work from special funds, as follows:

1. Ophthalmia prophylactic fund.
2. Diphtheria antitoxin fund.
3. Venereal disease fund, to the extent of 3 per cent, which represents the amount spent for congenital syphilis.
4. Division of Sanitation fund for clean milk campaigns outside Minneapolis, St. Paul, Duluth. The Division spends about \$4,700 a year in this work, and clean milk is needed chiefly for young children, having demonstrated influence on diarrheal diseases, as well as general development and nutrition in relation to tuberculosis, etc.
5. Preventable disease fund. In 1921 the morbidity reports show that 4 per cent of the total cases of notifiable diseases occurred among children under 5 years of age. In view of the fact that two very important diseases of this age group—whooping-cough and measles—are very incompletely reported, to say that 6 per cent of the total appropriation for the Division is used for the benefit of children under six, is conservative.

\* \* \* \* \*

I hope to have all questions decided and staff employed so that the actual work may begin about June 1.

\* \* \* \* \* Respectfully,

A. J. CHESLEY, M.D.,  
Executive Officer,  
State Board of Health.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The midsummer meeting of the Southern Minnesota Medical Association is scheduled for Monday and Tuesday, June 19 and 20, 1922, at Rochester, Minn. Headquarters will be at the Hotel Kahler.

Registration blanks for assignments to special demonstrations and symposiums are being sent out to the members and must be filled out and mailed not later than June 15th to Dr. Howard R. Hartman, chairman. A large attendance is assured and registration should be made early.

Physicians are earnestly requested to bring their wives

to this meeting as special entertainment will be provided for visiting ladies.

Special attention is called to the arrangement made, whereby railroad transportation may be secured for a fare and one-half providing a certificate or receipt showing the purchase of one-way ticket is secured and presented when purchasing return ticket. This special rate covers the territory including Illinois, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Wisconsin and from Julesburg, Colorado.

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## Official Stenographer

Dr. Aaron F. Schmitt, Secretary General,  
705-707 Physicians & Surgeons Building, Minneapolis.

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*Committee of Entertainment for Rochester Meeting:*

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*Committee on Resolutions:*

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Dr. F. R. Huxley, Faribault, Minn.  
Dr. C. C. Allen, Austin, Minn.

*Committee on Nominations:*

Dr. M. C. Piper, Chairman, Rochester, Minn.  
Dr. George Stevens, Byron, Minn.  
Dr. W. H. Rowe, St. James, Minn.

## ENTERTAINMENT FOR VISITING LADIES

## MONDAY FORENOON

## At the Kahler

10:30 A. M.—Lecture, "The Application of Mental Hygiene to the Family"—Dr. T. Wheeler (Mrs. Wm. Finny), Sun Room, Kahler.

12:00 A. M.—A Picnic Luncheon, Mayo Park, under the auspices of Olmsted County Medical Society.

## MONDAY AFTERNOON

2:00 P. M.—Auto Ride starting from The Kahler.

3:00 P. M.—Reception and Tea given by Mrs. C. H. Mayo at residence; Reception and Tea given by Mrs. W. J. Mayo at residence (immediately following auto ride). (Gentlemen are welcome.)

5:00 P. M.—Transportation will be furnished to bring the guests back to The Kahler.

6:30 P. M.—Semi-annual Banquet at High School. (Informal.)

## TUESDAY FORENOON

10:30 A. M.—Lecture, "Combustion Products of Fuel and the Cancer Problem"—Dr. G. M. Luden, Sun Room, Kahler.

## TUESDAY AFTERNOON

2 to 5 P. M.—The Visiting Ladies will be entertained by the Magazine Club at the Golf Course at Tea, Golf and Bridge.

The Golf Club has made arrangements so that the afternoon of Sunday, the 18th, the Golf House and Course will be at the disposal of the Southern Minnesota Medical Association. Matched plays or a tournament can be arranged if a sufficient number will avail themselves of the privilege.

The afternoon of Tuesday, the 20th, the Golf House and Course are given over to the visiting ladies and their hostesses. Such physicians as are not attending the meetings that afternoon are cordially invited to use the course.

## MONDAY FORENOON

June 19th, 8 A. M.

## Program of General Meeting

## Methodist Church

*Symposium of Thyroid Diseases*

8:00—Dr. W. A. Plummer, Exophthalmic Goiter.

8:30—Dr. C. A. Hallberg, Thyroiditis.

8:45—Dr. F. A. Willius, The Heart in Hyperthyroidism.

9:00—Dr. W. M. Boothby, The Relationship of Basal Metabolic Rate to Hyperthyroidism.

9:30—Dr. H. S. Plummer, Diseases of the Thyroid.

11:00—Dr. Walter H. Valentine, Tracy, Minnesota, The Early Symptoms of Acute Poliomyelitis.

*Symposium on Diseases of Urinary Tract in Children*

10:00—Dr. S. Amberg, Enuresis.

10:30—Dr. H. F. Helmholtz, Pyelitis: a. Relation to respiratory tract infection; b. Treatment.

11:00—Dr. H. O. Foucar, Tumor of the Kidney.

## MONDAY AND TUESDAY FORENOON

June 19 and 20, 1922—8 A. M.

*Special Clinical, Surgical and Medical Demonstrations*

BY	PLACE	NATURE	DURATION	ATTEN-
			HOURS	DANCE LIMITED TO
Surgical Staff .....	St. Mary's Hospital New Surgical Pavilion .....	Surgical Clinics .....	Four	20
Surgical Staff .....	Kahler (11th Floor).....	Thyroid Surgery .....	Four	30
Surgical Staff .....	Colonial Hospital (5th Floor).....	Surgical Clinics .....	Three	50
Drs. W. C. MacCarty and A. C. Broders	Pathologic Laboratory, St. Mary's Hospital .....	Demonstration in Fresh Tissue Pathology .....	Four	100
Dr. W. F. Braasch	Colonial Hospital (3rd Floor, Nurses' Desk) .....	Urologic Ward Rounds and Cystoscopic Technique .....	Two	5
Dr. P. P. Vinson.....	Kahler (11th Floor, Operating Room 3) .....	Esophageal Stricture .....	One	30
Dr. G. B. New.....	Worrell Hospital (3rd Floor, Room 1) .....	Surgical Clinic in Laryngology, Oral and Plastic Surgery .....	Four	10
Dr. W. L. Benedict...	Worrell Hospital (3rd Floor, Room 2) .....	Surgery of the Eye.....	Four	10
Dr. H. I. Lillie.....	Worrell Hospital (3rd Floor, Room 3) .....	Surgery of the Ear, Nose and Throat .....	Four	10
Dr. H. R. Lyons.....	Worrell Hospital (3rd Floor, Room 4) .....	Surgery of the Ear, Nose and Throat .....	Four	10
Dr. B. E. Hempstead..	Worrell Hospital (3rd Floor, Room 5) .....	Surgery of the Ear, Nose and Throat .....	Four	10
Drs. W. F. Braasch and J. L. Crenshaw	Mayo Clinic, 2nd Floor.....	Cystoscopic Technique and Interpretation of Pyelograms.....	Three	5
Dr. F. L. Smith.....	Mayo Clinic (Ground Floor, Desk C-B) .....	Demonstration of Methods of Post-Operative Care .....	One	10
Drs. M. C. Piper and D. F. Hallenbeck	Kahler (7th Floor, Hospital Desk) ..	Medical Ward Rounds.....	One	5

## MONDAY AND TUESDAY FORENOON

June 19 and 20, 1922

*Special Clinical Demonstration—Surgical and Medical*

A. M.	BY	PLACE	NATURE	DURATION	ATTEN-
				HOURS	DANCE LIMITED TO
9:00	Drs. W. S. Lemon, H. M. Conner and F. W. Gaarde	Mayo Clinic (3rd Floor, Desk B-3) ..	Clinical Demonstrations of Thoracic Disease .....	One	10
10:00	Drs. A. H. Sanford and T. B. Magath	Mayo Clinic (2nd Floor, Desk B-2) ..	Demonstration of Clinical Laboratory Methods .....	One	10
10:00	Drs. B. S. Gardner and L. T. Austin	Mayo Clinic (1st Floor, Desk G-1) ..	Interpretation of X-Ray Dental Films .....	One	25
10:00	Drs. J. H. Stokes, P. A. O'Leary and W. H. Goeckerman	Worrell Hospital Annex, 3rd Floor..	Dermatosyphilological Demonstration.	One	25
10:00	Drs. H. H. Bowing, A. DesJardins and Mr. H. O. Stearns	Currie Hospital, Desk H, 2nd Floor..	Radium and Roentgen-Ray Therapy, the Physics of Radium and Roentgen-Ray .....	One-half	20
11:00	Dr. L. W. Pollock...	Kahler (7th Floor Hospital Desk) ..	Enterology .....	One	10
11:00	Drs. W. L. Benedict and W. I. Lillie	Mayo Clinic (2nd Floor, Desk E-2) ..	Neurologic Ophthalmology .....	One	10

11:00 Drs. R. D. Carmen and A. B. Moore Mayo Clinic (2nd Floor, Desk A-2) . . . X-Ray Examination of the Thorax . . . One 10

# MONDAY FORENOON ONLY

## *Special Clinical Demonstrations—Surgical and Medical*

A. M.	BY	PLACE	NATURE	ATTEN-	
				DURATION HOURS	DANCE LIMITED TO
8:00	Dr. M. S. Henderson	Colonial Hospital	Orthopedic Ward Walk	One	5
8:00	Dr. W. S. Lemon (Clinical)	Assembly Room, 3rd Floor, Mayo Clinic	Symposium on Diseases of the Chest, Case Demonstrations	Two	100
	Dr. A. B. Moore (Roentgen-Ray)				
	Dr. C. A. Hedbloom (Surgical)				
10:00		Assembly Room, 3rd Floor, Mayo Clinic (Monday only)	Symposium on Blood and Blood Forming Organs	Two	100
	Dr. T. L. Szlapka	15 Minutes	The Diagnosis and Treatment of Pernicious Anemia		
	Dr. A. H. Sanford	20 Minutes	Grouping, Fragility and Duodenal Pigments		
TO	Dr. B. S. Eager	15 Minutes	Remarks on Transfusions		
	Dr. W. Ashby	15 Minutes	Theories Concerning Blood Destruction		
	Dr. S. F. Haines	15 Minutes	Blood Volume Examinations		
	Dr. M. B. Bonta	15 Minutes	Unusual Types of Leukemia		
	Dr. H. Z. Giffin	15 Minutes	Splenectomy		
12:00		15 Minutes			

# MONDAY AFTERNOON

June 19th, 2 P. M.

Methodist Church

Dr. William B. Coley	New York	End Results in 170 Cases of Sarcoma of the Long Bones Treated by Various Methods since 1910.
Dr. George E. Shambaugh	Chicago, Illinois	Otolaryngology and the General Practitioner.
Dr. Willis C. Campbell	Memphis, Tennessee	Mobilization of Joints with Bony Ankylosis.
Dr. Herman L. Kretschmer	Chicago, Illinois	The Diagnosis and Treatment of Stone in the Ureter.
Dr. George J. Heuer	Cincinnati, Ohio	Lung Abscesses.
Dr. Arthur B. Ancker	St. Paul, Minnesota	Hospital Standardization.

# MONDAY EVENING

June 19th, 1922

High School

Banquet—6:00 o'clock P. M.

(Informal)

SCIENTIFIC PROGRAM

Banquet Hall, 7:30 o'clock P. M.

Dr. C. H. Mayo	Presiding.
Dr. W. B. Cannon	Boston, Massachusetts . . . . . Some Recent Advances in the Physiology of Internal Secretion.
Dr. Judson Daland	Philadelphia, Pennsylvania . . . . . The Diagnosis of Focal Infection.
Dr. Fred H. Albee	New York City, New York . . . . . Reconstruction Surgery.
Dr. M. G. Seelig	St. Louis, Missouri . . . . . Bile Duct Anomalies as a Factor in Cholecystitis.



TUESDAY FORENOON  
June 20th, 8:30 A. M.  
Programs of General Meeting  
Methodist Church  
*Symposium on Nephritis and Diabetes*

8:00	Dr. N. M. Keith.....	Hypertension in Cardiac and Renal Disease.
8:30	Dr. Geo. E. Brown.....	Capillary Changes in Cardiorenal Disease. (With lantern demonstrations.)
9:00	Dr. L. G. Rowntree.....	Water Balance and Water Intoxication.
9:30	Dr. R. Fitz .....	An Improved Alimentary Glucose Tolerance Test.
10:00	Dr. R. M. Wilder.....	The Dietary Management of the Diabetic Patient.
10:30	Dr. E. C. Rosenow.....	Further Studies in Encephalitis and Epidemic Hiccough.
11:30	Dr. C. A. Hedblom.....	Demonstration of Thoracic Surgical Cases.
11:20	Dr. H. J. Lloyd, Mankato, Minn.....	Non-Surgical Drainage of the Biliary Tract.
11:00	Dr. Georgine Luden .....	Progress in Cancer Research.
12:00	Dr. J. E. Crewe, Rochester, Minn.....	Factors in Longevity.

TUESDAY FORENOON ONLY  
*Special Clinical Demonstrations—Surgical and Medical*

A. M.	BY	PLACE	NATURE	DURATION HOURS	ATTEN- DANCE LIMITED TO
8:00		Assembly Room, 3rd Floor, Mayo Clinic .....	Symposium on Gastro-intestinal Dis- ease .....	Two	100
	Dr. D. M. Berkman.....	15 Minutes	Gastric Retention Symptoms, Com- plications and Management		
	Dr. H. R. Hartman.....	15 Minutes	Diagnostic and Therapeutic Aspects of Biliary Drainage		
	Dr. W. Walters.....	15 Minutes	Pre-operative Preparation of Patients with Obstructive Jaundice		
	Dr. L. A. Buie.....	15 Minutes	Proctoscopy and Its Value in Gen- eral Practice		
	Dr. G. B. Eusterman.....	30 Minutes	Gastro-enterologic Clinic with Case Demonstration		
8:00	Dr. H. W. Meyerding..	Colonial Hospital .....	Orthopedic Ward Walk.....	One	5
10:00	Tuesday only .....	Assembly Room, 3rd Floor, Mayo Clinic .....	Neurologic Clinical Conference....	Two	100
	Drs. W. D. Sheldon, H. W. Woltman and H. L. Parker				

TUESDAY AFTERNOON  
June 20th, 2 P. M.  
Methodist Church

Dr. Preston H. Hickey.....	Detroit, Michigan .....	Recent Advances in the Therapy of Carcinoma.
Dr. Nathaniel G. Alcock.....	Iowa City, Iowa.....	An Analysis of a Series of Cases of Renal Tuberculosis.
Dr. George V. I. Brown.....	Milwaukee, Wisconsin .....	Plastic Surgery in Civil Practice.
Dr. A. A. Law.....	Minneapolis, Minnesota .....	Reconstruction of Tibia by Utilizing the Fibula.
Dr. J. G. Cross.....	Minneapolis, Minnesota .....	Acute Benign Leukemia.
Dr. Albert G. Schulze.....	St. Paul, Minnesota.....	Concerning the Vomiting of Pregnancy and Its Treat- ment.

### NORTHERN MINNESOTA MEDICAL ASSOCIATION

President—Dr. C. O. Estrem, Fergus Falls.  
Vice President—Dr. Roy E. Swanson, Alexandria.  
Secy.-Treas.—Willard L. Burnap, Fergus Falls.

#### COMMITTEES

##### PROGRAM

W. L. Burnap, M. D. .... Fergus Falls  
W. W. Will, M. D. .... Bertha  
C. B. Lewis, M. D. .... St. Cloud

##### ENTERTAINMENT

L. H. Rutledge, M. D. .... Detroit  
E. E. Hoit, M. D. .... Detroit  
L. C. Weeks, M. D. .... Detroit  
W. D. Dix ..... Detroit  
Fred Dennis ..... Detroit

##### REPRESENTATION

O. J. Hagen, M. D. .... Moorhead  
J. Nicholson, M. D. .... Brainerd

##### ARRANGEMENT

O. O. Larson, M. D. .... Detroit  
J. E. Carman, M. D. .... Detroit  
Fred Dennis ..... Detroit  
H. L. Stoner ..... Detroit

##### AUDITING

E. H. Smith, M. D. .... Bemidji  
H. C. Cooney, M. D. .... Princeton

##### CENSORS

O. O. Larson, M. D. .... Detroit  
O. F. Mellby, M. D. .... Thief River  
O. E. Locken, M. D. .... Crookston

The annual meeting of the Northern Minnesota Medical Association will be held in Detroit, Minn., June 5, 6 and 7, 1922.

The program will include clinics offered by the members and an interesting number of addresses by local and outside members of the profession will be delivered.

The program includes the following:

Dr. Paul B. Magnuson. .... Chicago  
Dr. Nelson M. Percy. .... Chicago  
Dr. H. M. Helmholtz ..... Rochester  
Dr. N. S. Henderson. .... Rochester  
Dr. O. W. Rowe. .... Duluth  
Dr. F. J. Hirschboeck. .... Duluth  
Dean Alfred Owre. .... Minneapolis  
Dr. E. K. Huenekens ..... Minneapolis  
Dr. F. L. Adair. .... Minneapolis  
Dr. E. L. Gardner. .... Minneapolis  
Dr. F. J. Corbett. .... Minneapolis  
Dr. C. A. Donaldson. .... Minneapolis

Dr. Kenneth Phelps ..... Minneapolis  
Dr. Henry L. Ulrich. .... Minneapolis  
Dr. C. N. Hensel. .... St. Paul

### UPPER MISSISSIPPI VALLEY MEDICAL SOCIETY MEETING

The Spring Meeting of the Upper Mississippi Medical Society was held in Little Falls, Minn., on May 2, 1922. The following papers were read:

Legislative Problems—Dr. F. J. Savage, St. Paul, Minn. Discussed by Dr. J. G. Millsbaugh, Little Falls, Minn.

Artificial Pneumothorax—Dr. Everett K. Geer, St. Paul, Minn. Discussed by Dr. J. Douglas, State Sanatorium, Minn., Dr. F. F. Callahan, Pokegama, Minn.

X-Ray Diagnosis of Tuberculosis—Dr. F. F. Callahan, Pokegama, Minn. Discussed by Dr. J. E. Douglas, State Sanatorium, Minn., Dr. E. K. Geer, St. Paul, Minn.

Herpes Zoster Ophthalmicus—Dr. A. V. Garlock, Bemidji, Minn. Discussed by Dr. C. G. Nordin, Brainerd, Minn., Dr. N. Nelson, Brainerd, Minn.

A Typhoid Case History with Unusual Complications—J. B. Holst, Little Falls, Minn. Discussed by Dr. L. M. Roberts, Little Falls, Minn., Dr. R. A. Beise, Brainerd, Minn.

X-Ray Therapy—Dr. Desjardens, Rochester, Minn. Discussed by Dr. R. A. Beise, Brainerd, Minn.

Goiter—Dr. T. L. Chapman, Duluth, Minn. Discussed by Dr. J. A. Thabes, Brainerd, Minn.

### OF GENERAL INTEREST

Dr. R. H. Mattson of Minneapolis has located at Steven, Minn.

The Minnesota Neurological Society met in Rochester May 13.

Dr. Robert Forbes of Duluth is taking a post-graduate course at New York.

Dr. D. E. Seashore of Duluth is convalescing from an operation at St. Luke's Hospital.

Dr. and Mrs. Wallace Cole are receiving congratulations on the birth, May 14th, of a son.

Dr. August Kuhlmann, Melrose, has announced his candidacy for Coroner of his county.

Dr. and Mrs. J. P. Sedgwick and family of Minneapolis have returned from Los Angeles.

Dr. Hilding Anderson, formerly of Minneapolis, is now associated with Dr. D. E. Tilderquist of Duluth.

Dr. M. J. Fiksdal, formerly of the Peabody Hospital Clinic of Webster, S. D., has located at Appleton, Minn.

Dr. F. N. Hunt, Fairmont, has returned after spending six weeks in California.

Dr. J. L. Mills, graduate of Minnesota in 1921, has located in Winnebago City.

Dr. Nels Westby was elected mayor of Madison, Minnesota, at the city election April 4th, 1922.

Dr. and Mrs. L. G. Rowntree of Rochester are receiving congratulations on the birth of a daughter.

Dr. Jas. Farrage, Winnebago City, has been compelled to discontinue practice because of poor health.

It is reported that Dr. Dan Bessen, son of Dr. Albert Bessen of Minneapolis will locate at Albert Lea, Minn.

The Redwood-Brown County Medical Society will hold its annual meeting on June 15th in the Sleepy Eye State Park.

We are glad to report the recovery of Dr. W. H. McKenna of Austin, Minn., from a severe attack of pneumonia.

Dr. F. J. Bohland, Belle Plaine, has just recently returned from a winter's sojourn in California for the benefit of his health.

Dr. E. F. Conyngham, formerly of Missoula, Montana, has located at Underwood, Minn., where he will engage in practice.

A series of lectures by different members of the staff are being given at St. Mary's Hospital, Duluth, for internes and staff.

Dr. H. L. Lamb of Sauk Center left recently for Chicago, where he will take post-graduate work in medicine and surgery.

Dr. J. C. Jensen of Hendricks has gone to Phoenix, Arizona, with the hope that the change may prove beneficial to his health.

Dr. Robert Emmett Farr of Minneapolis read a paper on "Local Anesthesia" before the Chicago Medical Society on April 26th, last.

A new modern office building is being planned for Duluth downtown district, and many physicians and dentists are applying for space.

The Association of Resident and ex-Resident Physicians of the Mayo Clinic held its fourth annual meeting in Rochester, May 29 and 30.

Dr. A. A. Passer is serving his third consecutive term as president of the Village Council of Olivia, having been re-elected at the spring election.

Dr. M. P. Gerber is now located at Brainerd, Minn., associated with Drs. Thabes, Badeaux and Nordin, and is specializing in children's diseases.

Dr. Harry Zimmerman of St. Paul read a paper on "Mechanical Factors in Abdominal Drainage" before the St. Louis County Medical Society, April 20th.

Dr. C. S. Bigelow and wife of Two Harbors have returned home after a month's visit at Hutchinson, Kansas. Dr. and Mrs. Bigelow made the trip by automobile.

Dr. and Mrs. Clayton K. Williams, 2115 Dudley Ave., St. Paul, sailed Thursday on the Empress of Scotland from Quebec for a year's stay abroad. They will travel in Switzerland, where Mrs. Williams will study art. Dr. Williams will spend the greater part of the time in Munich, Zurich, and also in Switzerland.

Dr. Byron O. Mork of Worthington has gone to Norway for an extended vacation. While in Europe, Dr. Mork will visit the French battlefields and other points of interest.

Dr. Winter, who has resigned his fellowship in the Mayo Foundation, will engage in the practice of internal medicine in the Andrus, Garberson, Buskirk Clinic, Miles City, Montana.

Dr. W. H. von Lackum, of Chicago, has come to the Mayo Clinic as Associate in the Section on Urology, where he will take charge of the work of special urology and allied fields.

Dr. John J. Whyte, formerly of Castlewood, S. D., has removed to Chokio, Minn. Dr. Whyte formerly practiced in Minnesota, but at the close of the war, in which he saw service, he removed to South Dakota.

Dr. J. J. Eklund is president of the Duluth National Bank. This bank is experiencing unusually rapid growth and is now ready to move into its new stone building, construction of which is nearly completed.

The Lake City Hospital was closed March first, temporarily, to permit of a reorganization, especially along the lines of financial management. There does not seem to be any immediate prospect of its reopening.

Dr. Charles E. Proshek, who left Minnesota in 1919 to serve with the American Red Cross in Siberia, Russia, Poland, Greece and Montenegro, has returned to this country for a visit with his parents at New Prague, Minn.

The addition to St. Mary's Hospital, Rochester, is completed and was opened last month with appropriate ceremonies. This new building contains a new set of operating rooms furnished according to the latest ideas, including accommodations for the visiting physicians.

News comes that Dr. H. R. Weirick, former mayor of Hibbing, in charge of the Rood Hospital in South Hibbing, has signified his intentions of becoming a candidate for the House of Representatives, Minnesota Legislature. Here's wishing Dr. Weirick success in his campaign.

Dr. O. J. Hagen of Moorhead, who is a delegate from the Clay-Becker Medical Society, took in the meeting of the American Congress of Internal Medicine at Rochester, and also the Minneapolis Clinic Week, besides visiting other eastern cities. Mrs. Hagen accompanied him.

The Board of Governors of the Mayo Clinic has voted to install a radio receiving station in the lobby of the Clinic. Investigations are being made with regard to the type of instrument best suited for use and it is hoped that installation will be effected within the next three months.

Dr. Donald K. Bacon, son of Dr. L. C. Bacon of St. Paul, is associated with his father in the practice of medicine. After graduating from the University of Minnesota, Dr. Bacon spent about two years with Dr. Crile of Cleveland and was resident surgeon at the Harper Hospital in Detroit, Mich.

Dr. and Mrs. T. L. Birnberg of St. Paul sailed Saturday, May 13th, for an extended visit in European countries. During the tour Dr. and Mrs. Birnberg plan to visit Berlin, Hale, Vienna, Munich, Heidelberg and other points. They expect to return to the United States during the latter part of August.

Dr. G. A. Newman, physician to the Minnesota State Prison at Stillwater, who has been seriously ill for several months, during which time he has been a patient at St. Luke's Hospital, St. Paul, is reported as greatly improved. During Dr. Newman's absence his duties at the prison have been discharged by Dr. D. Kalinoff of Stillwater.

Dr. J. C. Rothenburg of Springfield has filed for the office of representative-at-large from Brown and Redwood counties. He is being opposed by E. C. Stahn, a farmer, who has run twice before with the backing of the Non-Partisan element. Dr. Rothenburg was very active on the draft board during the World War and is one of our most broad-minded, patriotic citizens.

At the last meeting of the Park Region Medical Society, Dr. A. B. Cole of Fergus Falls was voted an honorary member of the society. Dr. Cole is one of the pioneer physi-

cians of the western part of the state and has been very active in his profession until last winter when he found it necessary to go South for his health. He returned a few weeks ago much improved in health and is now limiting his work mostly to office practice.

The new addition of St. Mary's Hospital, Duluth, is now nearing completion. It is a beautiful structure and embodies the most modern ideas in hospital construction. This addition together with the million dollar hospital to replace St. Luke's, for which the money has been raised by popular subscription, and the A. M. Miller City Hospital, for the construction of which \$600,000 has been bequeathed, will give Duluth hospital facilities far above the average for cities its size.

Dr. H. T. McGuigan and Mrs. McGuigan of Red Wing, sailed recently for Europe on the Cunard liner *Mauretania*. Dr. McGuigan will attend a number of clinics and take post-graduate work. After landing at Cherbourg, France, the tourists plan to visit Paris, the battlefields of the World War, Coblenz, and also will attend the Passion Play at Oberammergau. The doctor also expects to spend about a month in clinical work in hospitals at Edinburgh, Scotland, and in England. Dr. and Mrs. McGuigan expect to return home late in September.

#### PHYSICIANS LICENSED AT THE APRIL, 1922, EXAMINATION TO PRACTICE IN MINNESOTA

##### BY EXAMINATION

<i>Name</i>	<i>School of Graduation</i>	<i>Address</i>
Bachman, Harry Wilson.....	U. of Pa., M. D., 1917.....	Rochester, Minn.
Bowler, John Pollard.....	Harvard, M. D., 1919.....	Rochester, Minn.
Greene, Carl Hartley.....	Johns Hopkins, M. D., 1921.....	Rochester, Minn.
Jackson, Geo. Henry, Jr.....	Harvard, M. D., 1918.....	Rochester, Minn.
Magoun, Jas. Albert Hughes, Jr....	U. of Pa., M. D., 1916.....	Rochester, Minn.
Moench, Laura Mary.....	Johns Hopkins, M. D., 1919.....	Rochester, Minn.
Reid, John Spence.....	Toronto, M. B., 1920.....	Rochester, Minn.
Stark, Wm. Berkeley.....	Toronto, M. B., 1915.....	Rochester, Minn.

##### THROUGH RECIPROCITY

Athens, Alvin Glenwood.....	Johns Hopkins, M. D., 1919.....	Buhl, Minn.
Barborka, Clifford Joseph.....	Rush, M. D., 1921.....	Rochester, Minn.
Bauguess, Harry .....	Omaha Med. Col., M. D., 1899.....	Minneapolis, 1206 4th St.
Berry, Walter Durant.....	Med. Col., Ohio, M. D., 1897.....	Battle Lake, Minn.
Burns, Robert Emmett.....	U. of Pa., M. D., 1919.....	Rochester, Minn.
Calene, John Lucian.....	Rush, M. D., 1921.....	Rochester, Minn.
Dunlap, Harold Foster.....	Indiana U. Sch. of Med., 1920.....	Rochester, Minn.
Foley, Frederic Eugene Basil.....	Johns Hopkins, M. D., 1918.....	St. Paul, care Miller Clinic
Gilmer, Peachy Robert.....	Tulane, M. D., 1921.....	Rochester, Minn.
Hansel, French Keller.....	St. Louis U., M. D., 1918.....	Rochester, Minn.
Haynes, Aaron Lorenzo.....	Ia. Col. P. & S., M. D., 1895.....	New Market, Minn.
Hench, Philip Showalter.....	U. of Pittsburgh, M. D., 1920.....	Rochester, Minn.
Hoyer, Hans August.....	Detroit Col. Med. & Surg., M. D., 1921.....	Delavan, Minn.
Kingsbury, Ernest Mills.....	U. of Ia. (Homeo. Dept.), M. D., 1906.....	Clearwater, Minn.
Koucky, John Douglas.....	Rush, M. D., 1921.....	Rochester, Minn.
Larrabee, Scott G.....	Bowdoin, M. D., 1906.....	St. Paul, Piedmont Apt.
Lorenzen, Fredrick Charles.....	Wis. Col. P. & S., M. D., 1909.....	Elgin, N. Dak.
Swan, Theo. Strong.....	U. of Pa., M. D., 1920.....	Rochester, Minn.

##### NATIONAL BOARD CREDENTIALS

Giordano, Alfred Sabato.....	Syracuse Univ., M. D., 1920.....	Rochester, Minn.
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## PROGRESS

Abstracts to be submitted to Section Supervisors.

### MEDICINE

#### ABSTRACTS FROM RECENT MEDICAL AND PUBLIC HEALTH PAPERS, PREPARED BY DIRECTOR VENEREAL DISEASES U. S. PUBLIC HEALTH SERVICE

**DIAGNOSIS OF INCIPIENT TABES:** G. C. Bolton (Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam, October 8, 1921; Journal A. M. A., January 28, 1922). Bolton describes some cases of unmistakable incipient tabes in which none of the four specific tests of spinal fluid or tests of the blood elicited a positive reaction. In some cases isolated paralysis of the ocular muscles, beginning atrophy of the optic nerve, with sluggish pupil reactions or anisocoria, may be regarded as testifying to tabes, even in the absence of all other signs, as also a symmetrical hard ulcer on the soles, the falling out of the hair and of sound teeth, a spontaneous fracture, or isolated crises in the larynx, bladder, stomach or arms. These may long precede other manifestations of the disease.

**THE RATIONALE OF THE WASSERMANN REACTION:** J. E. R. McDonagh (Lancet, London, December 24, 1921). "Some have laid great stress upon the possible interpretations of a positive and negative reaction, but those with large clinical experience are coming to the conclusion that a negative reaction signifies nothing, and that a positive reaction means no more than that the patient has had syphilis." The main object of this paper is to detail as far as possible the changes undergone by the protein particles in syphilis and to throw some light on certain problems which so far have remained unsolved.

**STANDARDIZATION OF SUSPENSION OF RED BLOOD CELLS FOR WASSERMANN TESTS:** Joseph W. Bigger (Lancet, London, December 31, 1921). "Methods usually adopted for making suspensions of red blood cells for the Wassermann test are very rough and the resulting suspensions vary greatly in strength." Such variations may introduce considerable error in the results of the test. A simple and rapid method of standardizing red blood cells is described. This method was controlled by counting the number of cells per c.c. in 12 suspensions and was found to be accurate.

**TREATMENT OF SYPHILIS:** J. E. R. McDonagh (Medical Press, London, December 28, 1921). McDonagh emphasizes the fact that treatment should be such as to increase the individual's resistance to the disease. "This can only be brought about by stimulating and not by destroying the resisting substance, and unfortunately in the majority of cases being treated today the latter and not the former is both aimed at and achieved." He sums up his conclusions: (1) that the chemotherapeutic agents cause the symptoms to vanish quicker, but bring us no nearer to curing the disease; (2) that the word cure should never be used, as all proof is wanting in any special case that a recurrence will never appear; (3) that each case must be treated individually and for at least two years; (4) that no reliance can be placed on tests at present in vogue for regulating treatment.

**SYPHILITIC JOINT DISEASE:** Dupont (Revue de Chirurgie, Paris, 1921; Journal A. M. A., January 21, 1922). Dupont found the multiplicity of the manifestations in the joint a feature of the syphilitic joint cases, as also that symmetrical articulations were usually involved, at the same time, or with a longer or shorter interval. The long duration of the joint affection and the frequent relapses are special features, as also the prompt and complete cure under treatment for syphilis. Radiography may be misleading. Nearly all the cases he has encountered had been mistaken for tuberculous, gonococcus, rheumatic or traumatic arthritis. In certain cases, traumatic injury of the joint seemed to have been instrumental in attracting the syphilitic lesion to develop at this point. In one young man an acute dysenteriform arthritis prepared the soil for a specific arthritis from inherited syphilis.

**SIGNIFICANCE OF BIOLOGIC REACTIONS IN SYPHILIS OF THE CENTRAL NERVOUS SYSTEM:** David J. Kaliski and Israel Strauss (Arch. of Neur. and Psychiatry, January, 1922). With notes on treatment, especially intraspinal. From the Neurologic Service of the Mt. Sinai Hospital, New York, authors state: "We believe that a mere increase in cells (pleocytosis) and in protein (globulin) with a transient Wassermann reaction points to irritation of the pia-arachnoid of the nature of a general septicemic reaction, temporary, and of doubtful significance as to the future involvement of the neuraxis. \* \* \* The constant presence of cells, globulin and a definite Wassermann reaction in all dilutions in early syphilis indicate a more serious membrane involvement, possibly the earliest signs of a definite organic involvement of the neuraxis."

Authors hold that intraspinal treatment is of very limited value and give their reasons for this belief.

Two outlines for treatment are given at the close of the articles, one for syphilis of the central nervous system, and one for early constitutional syphilis.

#### ABSTRACT OF A PAPER ON: SPINAL SUBARACHNOID BLOCKAGE, DETERMINED BY COMBINED CISTERN AND LUMBAR PUNCTURE

JAMES D. AYER

(The Arch. of Neurology and Psychiatry, January, 1922)

The so-called Froin syndrome in spinal fluid is almost pathognomonic of compression of the spinal cord, but its clinical value is almost nil. This is found usually only after destruction of the cord, too late for operative or therapeutic procedure. More recently it has been known that a relative protein increase in the spinal fluid is frequently found below a cord tumor, but this also could hardly be considered more than suggestive of cord contraction.

Ayer has shown in a previous paper that by combining a cistern and lumbar puncture he was able to demonstrate differences in the fluids from two areas, indicating that an obstruction existed between the two. He has now collected data from 71 such examinations and 65 patients. The patient is placed on his side so that the points of puncture in the cistern and lumbar regions are on the same horizontal plane. After local anesthesia is employed with procaine, punctures are made in the cisterna magna and the lumbar sac; a glass manometer being then attached to each needle. The manometric pressure should

be about the same in the two areas. Oscillations occur with pulse and respiration, and changes in pressure on coughing and deep breathing, but are most marked on employing pressure over the jugular vein in the neck. About 5 c.c. are then withdrawn through the lumbar needle, when the pressure should drop uniformly in both manometers. If obstruction occurs, the fall is pronounced in the lumbar region, but little change occurs in the pressure in the cisterna area. Conversely, if pressure on the jugulars is employed, in cases in which spinal subarachnoid block is present, a rise in pressure in the cistern manometer is entirely out of proportion to the rise in pressure in the lumbar area. It is similarly noted what effect 5 c.c. of fluid in the cistern needle has to do with the relative pressure in the lumbar manometer. Fluid from the two areas is examined in the usual manner for cells, Wassermann, colloidal gold, and for total protein; the latter being particularly important. By observing the effect on patients with optic nerve atrophy in general paresis, in whom the cisterna magna route had been employed for serum administration, they were able to establish data for normal individuals, and it was found that all changes which occurred took place promptly and to an equal degree in both manometers, regardless as to whether pressure was employed on the jugulars and fluid withdrawn from one or the other area.

The author cites several cases showing indications of subarachnoid block, all of which showed variations in the hydrodynamic pressures in the two areas, and also in the protein contents of the two fluids. These cases were all proved to have subarachnoid block by operation or by the beneficial effect of anti-syphilitic treatment.

It is not to be thought that every cord tumor will present the picture of block, but it is clearly shown that cord tumor frequently presents a block very early. Says that positive findings are of great value, but negative findings also are of relative importance.

The method is not without danger, and should not be employed except in cases which clinically show at least some definite evidences of interference with the circulation of the spinal fluid.

F. J. HIRSCHBOECK.

#### ABSTRACT ON: TYPES OF DIABETES MELLITUS

(Med. Clinics of North America, September, 1921)

Wilder attempts to classify the cases of diabetes mellitus encountered in 1920 at the Mayo Clinic, purely from the clinical standpoint, emphasizing the impossibility of making any pathologic classification which would be of definite value.

His series consisted of 298 patients under his observation during that year, and he groups them as follows:

(1) The cases of acute diabetes, characterized especially by abrupt onset, gradually falling carbohydrate tolerance, strength and weight. These patients have a tendency toward acidosis, the average age is 20 years, and comprise 19 per cent of the total. These are the classic, severe, fulminating diabetic cases.

(2) Vascular diabetes associated with hypertension, arteriosclerosis, or both, with or without renal complications. This is the most numerous group, and comprises 30 per cent of the entire series. With this type everyone is familiar. The blood sugar frequently is high,—out of

proportion to the usual findings in the urine. The patients are particularly prone to the diabetic complications incident to the arterial changes, such as gangrene, diabetic retinitis, cataract, paresthesias, etc.

(3) Diabetes of obesity: In classifying these cases the author has been careful to eliminate those which belong to Group 2 or Group 4, but nevertheless are overweight. In excluding these, he finds that there still is a moiety of 15 per cent which should be placed in this group. They usually respond to treatment very satisfactorily and are comparatively benign, but have a tendency to acidosis and starve too quickly in treating them.

(4) Interstitial pancreatitis: This is the surgical group, usually associated with gall bladder disease and pancreatic changes. About 20 per cent belong to this group. They usually respond quite well to surgical interference, and do well postoperatively.

(5) Miscellaneous persistent glycosuria: In this group he has placed patients who did not fall into any of the other groups, 5 cases having tumors in the pancreas, 15 glycosuria with hyperthyroidism, 5 with tumors of the brain, 4 with renal diabetes, 1 with lues, and 24 remaining unclassified.

F. J. HIRSCHBOECK.

#### TUBERCULOMA OF THE ISCHIO-RECTAL FOSSA— CASE REPORT

CURTIS C. MECHLING  
(Am. Proct. Soc., 1921)

The writer reported the following case:

The patient was a locomotive engineer, who had a slowly developing lump in the ischio-rectal fossa, becoming more tender as the size increased. The lump was hard, fixed and apparently attached to the ischium. There was no depreciation in the patient's general health, and the location of the tumor alone caused his inability to follow his usual occupation.

X-ray examination revealed no bone defects. Tentative diagnosis of lipoma was made, and the tumor resected, using local anesthesia. The incision was crescentic and inside the tuberosity of ischium, to place scar where there would be little wear on it. Fixation of the tumor was very firm, owing to the large amount of surrounding connective tissue. Section of tumor released much thin pus. The pathological diagnosis was tubercle. There was no other evidence of tuberculous process in the patient.

The patient is now well and working daily, but should be considered a tuberculosis suspect, and should be under inspection at intervals for other evidence of the disease.

#### A CLASSIFICATION OF PROCTOLOGIC FISTULÆ: TREATMENT OF EACH VARIETY

J. RAWSON PENNINGTON  
(Am. Proct. Soc., 1921)

The writer stated that many rectal diseases would receive better attention and treatment if more attention were given to the embryology, anatomy, physiology and hygiene of the rectum, anus, and contiguous structures. For years past he has emphasized the importance of the pectinate line as a guide to rectal diseases, for the great majority of these affections start to develop at the line itself or nearby. Quite recently he has enlarged this conception to take in the rectal fascia, and has christened the arrangement the

"splancho-somatic funnel." The sinuses, crypts and diverticula at the pectinate line form admirable catch-basins for foreign bodies and bacteria, and this unfortunate fitness is shown by the fact that about 85 to 90 per cent of fistulae open in this region. Classifying, he said that we have an anorectal fistula when the opening is located at the pectinate line; an anal fistula when in the anus; a rectal when through the wall of the rectum proper, and a recto-sigmoidal when through the wall of the bowel at the recto-sigmoid junction. Watering-pot, multiple, horseshoe, and other so-called varieties, are merely expressions of complexity, multiplicity, position, or shape of one or the other of the foregoing divisions or combinations of them.

He then said that each type of fistula calls for a different plan of relief, since it would be poor judgment to apply the same treatment to a simple anal channel—a perineal fistula, for instance—as is applied to one high up. Beginning with the simplest form, we have purely a local condition—perineal or other—which requires only incision, and should heal promptly. When we deal with an ano-rectal fistula, the state of affairs is more complicated, and complete resection of the tract and immediate suture, the procedure he has long advocated and practiced, will give the best results. When we get higher in the bowel and are confronted with a true rectal fistula, the inner orifice being in the ampulla two or three inches from the anus, excision with immediate suture is impracticable, and his "seton method" is called for. In recto-sigmoidal fistula the condition is still more grave, and here his method of applying the ligature has given splendid results. He stated, finally, that a rectal fistula, with a single tract and only one opening into the rectum, is much more serious than an anal fistula, with two or more openings into the anus and 25 or more openings on the buttocks. In fact, the number of external openings has but little to do with the relative gravity of the case.

#### RELATION OF PULMONARY AND ANO-RECTAL TUBERCULOSIS TO FISTULA-IN-ANO

SAMUEL G. GANT  
(Am. Proct. Soc., 1921)

The writer said that fistula-in-ano is seldom associated with pulmonary tuberculosis, and that of five thousand fistulae, operated on by him, less than 10 per cent were tubercular. True, tubercular sinuses are usually curable by operation unless the patients are remarkably devitalized, and lung involvement and skin affections do not result from a cure, as some believe. Fistulae, simple or tubercular, heal much slower when complicated by pulmonary tuberculosis and when cauterized, than when treated by mild stimulants like methylene blue 10 per cent. Tubercular sinuses associated with extensive involvement of mucosa and peri-anal skin may not heal, as they are usually secondary to serious lung involvement.

Tubercular fistulae are diagnosed by their large irregular openings and sinuses, undermined skin, abundant rice-water-like discharge, and by finding tubercle bacilli in pus or tissue from the infected area.

Palliative treatment, hygienic measures, forced feeding, etc., help to build up the patient for operation and prolong life, but do not cure tubercular sinuses or ordinary fistulae when the patient has pulmonary tuberculosis. Operation is the procedure of choice when the patient has reasonable

vitality. The technique consists of incising tracts and trimming of overhanging edges of mucosa and skin, and then applying the cautery to raw areas to forestall extension of infection by way of the lymphatics.

Etherization stimulates latent and active foci in the lung and is often responsible for death. The writer invariably employs local anesthesia in this class of cases, keeps the patients in the hospital but a short time, and thereafter requires them to spend their time in the open air, and observe the usual hygienic measures prescribed for patients afflicted with tubercular foci in the lungs.

The prognosis is fairly good except in cases where the patient is almost exhausted by lesions in the lung and bowel, but healing is slow whether the tubercular lesion is local or involves both the peri-anal region and lung.

## SURGERY

### PRESERVATION OF THE ANAL MUSCLES IN OPERATIONS FOR RECTAL FISTULÆ

GRANVILLE S. HANES  
(Am. Proct. Soc., 1921)

The writer expressed himself as follows:

1. If there are no serious complications almost every rectal abscess or fistula should be cured by operation with slight or no impairment of anal control. There is no test put upon the anal muscles in the way of controlling the rectal outlet when the patient is constipated, but only when the feces are soft or quite thin.
2. When there is an internal fistulous opening it usually passes through the anal wall at the junction of the rectum and anus, or, more correctly, at the recto-proctodeal junction. It is never through the wall of the rectum, unless there is some diseased state of the mucosa, as in ulcerations, strictures, etc.
3. In operating, the affected tissues, external to the anal and rectal walls, are dealt with in whatever manner best suits the operator. All the tissues surrounding the fistulous perforation through the anal wall are dissected away, leaving the external perforation in easy view. It can be brought into better view by inserting the index finger into the rectum and pushing that part of the wall outward. If there is redundant tissue (piles) inside the canal it should all be removed. Any ulcerated areas should be cauterized, especially at the internal perforation. The opening through the anal wall may be cauterized with a small Paquelin point or some chemical agent. Care should be exercised not to enlarge the perforation.
4. After-care determines the success one has in treating rectal fistulae. The external wound must be kept under careful observation, and the anal canal occasionally dilated. If the opening has not healed when the outside wound is about closed, a local anesthetic may be used and the muscles divided. There will then be the least possible separation of the circular fibers and, therefore, a minimum impairment to control.
5. The object to be obtained in operating by this method is to avoid, if possible, the destruction of the contour of the anal opening. If the parts maintain their normal rela-

tions and the wounds heal with no sulci in the anal wall, the patient's control will be secure.

### RETROPERITONEAL LIPOMAS—REPORT OF TWELVE CASES

MASSON, J. C., and HORGAN, E. J.

(Southern Minnesota Medical Association, December 5)

In a review of the literature it was found that most cases of retroperitoneal tumors are only diagnosed at operation. Some tumors, even then, have been thought malignant and inoperable.

The most striking fact about the tumor is the absence of symptoms due to it. In only four of the twelve cases, wherein the growth was degenerating, were there acute symptoms. In the remainder the presence of the tumor, variously diagnosed as of renal origin, ovarian cyst, and so forth, was the main indication for interference. Pain was severe in only one case. Three patients had ascites, but none had signs of obstruction.

The age of the patients varied from forty to seventy-two years, the average being fifty-five. There were five males and seven females, and the average duration of symptoms was three years.

The tumor is usually ovoid and movable, with a multiglobular surface and a doughy consistency. Its position varies with its origin, the most usual source being the perirenal fat. It may, however, develop from any retroperitoneal fat and in some instances may be palpable through the vagina or rectum.

The earliest case in which operation was reported is that of Lizars in 1824. This writer had expected to find an ovarian tumor.

In the differential diagnosis it should be borne in mind that ovarian tumors are usually more tense and have not the doughy consistency of the lipoma. Pregnancy should be excluded by the history and renal tumors by cystoscopic methods. The spleen is usually more firm and bears a notch in its free border, but it is easy to confound the two. In the majority of cases seen at the Mayo Clinic the true nature of the tumor was only learned at operation.

Fibromyomas and sarcomas are seen in the same situations. The former type of tumor is firm and cachexia produced by a sarcoma of like size would be very evident. Lipomas may undergo sarcomatous change.

The cause of lipomas is not known. It is, however, noted that in two of these cases the tumor developed in the perirenal fat after operations on the kidney.

Operation for removal of the growth may be very difficult if the tumor has displaced important vessels at the root of the mesentery, at the hilus of the kidney, or above the spine, and especially if degeneration has taken place.

In cases of large growths a midline incision is indicated and an attempt should be made to remove the entire mass, since recurrences are common.

A histologic description is given with clinical diagnoses, and attachments, location, and weight of the tumor in the cases reported.

### DISCUSSION ON THE PAPER OF DR. J. C. MASSON

DR. T. L. CHAPMAN, Duluth: We are greatly indebted to Dr. Masson for the exposition of a most remarkable

and unusual condition. In anticipating some discussion upon this subject, I had the pleasure of running over forty-eight cases in the literature which comprised nearly all of those down to 1906 or thereabouts, and perhaps nearly two-thirds of those reported at length in the literature.

The original classification was made not very much later than 1906, at which time the division of the sources of the growth was made for the first time into three classes which Dr. Masson spoke of—those from the perirenal tissue; those of indeterminate origin, which may be from any source of fat in the postperitoneal space; and those from the intermesenteric fat. There is nothing I can add that will throw any light on the beginnings of these cases. The most interesting feature concerning them is their extreme difficulty of surgical management in view of their pathologic basis, which is so trifling in itself.

It is noteworthy how remarkably this type of fat growths can insinuate itself between the folds of the mesentery and push the intestine up until the gut may be flattened out upon the apex of the mass caused by the tumor. This involves also, of course, a surrounding or a pushing aside of important blood vessels to the intestine and even the general systemic circulation by surrounding the main trunks. One can only deduce from the literature that operations of this type are dangerous to a great degree for the following reasons:

The enormous size of the growths; the manner and location of their progress and their concealment of essential structures, damage to which may cause loss of a patient's life.

**CLOSURE OF THE ABDOMEN WITHOUT DRAINAGE AFTER CHOLECYSTECTOMY AND CHOLEDOCHOTOMY**—H. M. Richter (Surg., Gyn. and Obst. 34, Feb., 1922—180-182): The earlier workers in gall-tract surgery often closed the abdomen without drainage, but on account of the resultant unpleasant sequelæ it became routine practice to use postoperative drainage. At the present time there is a growing tendency to close without drainage, although individual practice varies greatly. The author has closed the abdomen without drainage in infective conditions associated with a frankly developed peritonitis whenever he has been able to remove the source of continuous reinfection, except when the peritonitis has been far advanced. His list of cases includes those of acute appendicitis with peritonitis in children and adults, and perforated gastric and duodenal ulcers. There has been no death among his cases of appendicitis, which include fifty cases of children under thirteen years. In twenty consecutive cases of perforated gastric ulcer there were two deaths, one moribund patient dying six hours following operation, and the other five weeks following operation from a subphrenic abscess.

Operations on the biliary structures are analogous to gastro-intestinal surgery in that the peritoneal toilet can be quite perfectly completed, and have the advantage over intestinal surgery in dealing with less infective material.

Various discussions as to definite closure of the abdomen in gall-tract surgery, taken with the author's experience, suggest the following statement regarding cholecystectomy, choledochotomy, and operative mortality.



**Cholecystectomy.**—In cholecystectomy the following procedure should be followed: (1) The cystic duct should be clamped, cut and ligated with fine catgut; (2) the stump of the cystic duct should be left free after ligation, not covered in by folds of peritoneum; (3) the raw surface of the liver left by removal of the gall-bladder needs only temporary packing during the remainder of the operation and does not require suturing, which tends to produce dead space; (4) bile leakage from the raw surface of the liver is of slight importance; (5) a drain placed down to the row of sutures in the cystic duct is apt to cause leakage; (6) all cases do not permit closure without drainage since (a) persistent oozing from the liver demands packing, (b) jaundice usually demands drainage, and (c) unusually active infections or suppuration outside the gall-bladder demand drainage, and (7) the omission of drainage lessens the postoperative discomfort.

**Choledochotomy.**—In choledochotomy, where the common bile duct can be sutured and the abdomen closed without drainage, the advantages of the procedure are the same as in cholecystectomy. The maximum bile pressure in the duct is much less than the resistance of a line of fine sutures. The contents of the common duct are not nearly so infective as the contents of the bowel which is closed without drainage. The peritoneal coat, or, lacking that, a piece of omentum, must be included in the line of suture.

To suture the common duct and close the abdomen without drainage presupposes (1) that the peritoneal coat of the duct has not been rendered useless, (2) that the suture materials and needles are of the smallest, (3) that no stones are left or strictures overlooked, (4) that the diameter of the duct is sufficient to permit two lines of sutures with ample room for traumatic swelling, which must be expected, and (5) that the walls of the duct are not too infiltrated or too stiff to permit easy manipulation.

The abdomen should not be closed in duct cases in the presence of jaundice or acute infection.

The percentage of cases in which the abdomen can be closed with safety after choledochotomy is probably smaller than after cholecystectomy.

**Operative mortality.**—Mortality statistics that are not explanatory are misleading, particularly in a small series of cases. In more than 100 cholecystectomies in the author's series there were two deaths, one of coma in a case of cirrhosis of the liver with obliterative peritonitis and an associated nephritis, the other following several days of frank pneumonia.

Drainage of the peritoneal cavity is done too frequently. Removal of the source of continuous reinfection almost always justifies closure without drainage.

In the majority of gall-tract cases no considerable infection is present.

The author unhesitatingly advocates closure without drainage after cholecystectomy in suitable cases. Closure after operations on the common duct requires far more technical dexterity, but gives unusually satisfactory results.

W. H. SPRUNT.

## GYNECOLOGY AND OBSTETRICS

### SUPERVISORS:

ARCHIBALD L. McDONALD,

FIDELITY BLDG., DULUTH

ALBERT G. SCHULZE,

LOWRY BLDG., ST. PAUL

**RADIUM THERAPY IN CANCER OF THE NECK AND BODY OF THE UTERUS**—Henri Hartmann (*Gyn. et Obstetrique*, vol. 4, No. 4): Hartmann states that cancer of the cervix has received more benefit from radium than from surgery. The apparent cures are prompt and remarkable. Histological examination of the uterus subsequently removed at operation or autopsy has repeatedly demonstrated complete destruction of all cancer cells in the uterus, though they may persist in the parametrium or pelvic lymph nodes. He quotes figures from the French and American literature with many clinical cures, some of five and six years' standing. Recurrences are usually remote. Deep penetration from radium is uncertain and can not be depended upon to reach pelvic structures.

Technique is discussed at some length. The author prefers a single large dose of radium well filtered. The tube is placed in the uterine canal, and, in some cases, extra tubes are held in the vaginal cul-de-sac by special apparatus, and well packed. He describes a combined method of Proust which is recommended. The uterus is exposed through low laparotomy incision, the internal iliac vessels are ligated and small doses of radium on special carriers are introduced along the vessels to the parametrium. Similar carriers with radium can be introduced anteriorly near the cornua. The carriers are brought out through the abdominal wound and withdrawn at the proper time.

Hartmann advises against hysterectomy following successful radium treatment as being an unjustifiable risk. The use of radium following hysterectomy he regards as presenting great danger of injury to the bladder or rectum. Cancer of the body, he holds to be definitely curable by total hysterectomy and this is his choice. Hartmann prefers radium for all cancers of the cervix except under the following circumstances: 1. Advanced disease or recurrences with large pelvic masses. In these there can only be temporary and partial relief. 2. Extensive involvement of the wall of the bladder or rectum. Small doses are useless and large ones cause fistulae. 3. Pelvic inflammatory disease. 4. With early cancer, which is definitely operable, there is still difference of opinion, though many favor radium for these.

ARCHIBALD L. McDONALD.

**RADIO-THERAPY OF UTERINE FIBROIDS**—J. L. Faure (*Gyn. et Obstetrique*, *Revue Mens.*, vol. 4, No. 4): Faure stands as one of the leading abdominal surgeons of France, who has made notable contributions to the development of operative gynecology, particularly hysterectomy. He has followed the use of radium in his own clinic and in the literature for more than ten years and has been deeply impressed by the results obtained. His judgment therefore represents the conservative opinion of his country. He holds that the results are uniform and

definite both as regards control of hemorrhage and decrease in size of the tumor. Radium acts upon all of the genital structures: uterine mucosa, musculature, and blood-vessels, and upon the ovaries. However, there are many cases where the ovaries apparently escape, as witnessed by cases where control of bleeding is immediate or where the tumor disappears but regular menstruation continues. Faure accepts the advantages of radium: rapidity of action, which is prompt and continuous, and simplicity of technique, which he prefers without general anesthesia. He uses a moderate dose, 25 to 150 milligrams for from 12 to 60 hours, and makes an effort to preserve menstruation. If used with proper care and with proper indications, there should be no untoward effects. Burns can be prevented, infection from intra-uterine manipulation is rare, severe exacerbation of chronic pelvic inflammatory disease have been reported. The induction of the premature menopause in young women, Faure believes to be unavoidable and holds this as a capital objection to this treatment. Danger of encouraging malignant degeneration of tumors he does not accept as proven. With present technique radium is preferable to Roentgen ray therapy, though new developments in the latter may change this opinion, since the x-ray dosage may be controlled and does not require intra-uterine manipulation.

Faure then compares the results obtained with hysterectomy, which he regards as the most perfect and ideal operation in surgery. The cures from operation are absolute, there can be no recurrence of symptoms or growths, and restoration to health is rapid. Conservation of the ovarian function or even of the uterus is often possible. He holds that the choice would always be for surgical treatment were it not for the mortality of operation, which he accepts as 5 per cent. However, this means 95 per cent cures, which may be regarded as satisfactory for any form of therapy. Furthermore, Faure holds that if one considers the untoward complications of radium— inflammatory reactions, errors of diagnosis which allow development of unrecognized malignancy, and failures which later require operation under less favorable circumstances—the indirectly bad results will exceed those from surgery. He feels that this point is still debatable in the average case, and is certainly true unless the patients are carefully selected for radium therapy.

He would exclude from radium:

1. Those where the exact diagnosis between simple fibroid, and ovarian cyst, or other pelvic condition is uncertain.
2. Young women where there is possibility of a conservative operation.
3. Previous unsuccessful radium treatment.
4. Complicating inflammatory lesions of the pelvis, or lower abdomen.
5. Suspicion of gangrene, infection or degeneration of fibroids.
6. Submucous or subserous pedunculated tumors.
7. Fibroids complicating pregnancy causing dystocia.
8. Large rapidly growing tumors causing pressure.
9. Where there is suspicion of malignancy.

In general, all tumors of doubtful nature of behavior. Therefore, Faure concludes that in spite of the admitted excellent results of radium therapy in properly selected cases, there is still a vast field for surgery.

ARCHIBALD L. McDONALD.

## PEDIATRICS

### SUPERVISORS:

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ROY N. ANDREWS,  
MANKATO CLINIC, MANKATO

**EGG YOLK IN INFANT FEEDING**—Adolph G. De Sanctis (Arch. of Ped., Feb., 1922): During the last two years, the writer has used egg yolk as an adjunct in difficult feeding cases. Its value was recognized in certain cases which did not do well on various formulas and in which as much food was given as was possible. In an infant that was taking and assimilating more than the normal amount of calories per day and did not gain, there was added to its daily ration one teaspoonful of the yolk of a soft-boiled egg; the response was immediate. The child gained in weight and the general condition improved. The yolk was gradually increased until the whole yolk was added daily. The infant gained from 8 to 12 ounces weekly. That the gain of weight was due to the extra calories added can be ruled out because a three-months-old infant did not respond when 35 calories per pound were given daily.

The writer believes the gain in weight was due to the effect of the fat soluble B vitamins contained in egg yolk. Many other cases were tried with similar results.

The fact that orange juice was given before the addition of egg yolk would rule out that failure to gain in weight was due to a deficiency of the antiscorbutic vitamins. It was found that the egg yolk agreed with infants as early as the second month and very rarely caused any gastrointestinal disturbance.

R. N. ANDREWS.

**WHEN SHALL THE MEMBRANA TYMPANI BE INCISED, AND WHEN IS RE-INCISION INDICATED?**—Walter Lester Carr (Arch. of Ped., Feb., 1922): A routine examination of the ears and throat should be made in all infectious diseases, and in every condition where there is a question as to the cause of irregular high temperature, with or without pain. A child may have pain without a rise of temperature or at the most a degree above normal, or there may be restlessness and irritability without temperature and pain.

If the tympanum is found red and bulging the incision is made at once. It may be possible to abort a mild condition by the use of adrenalin solution, 1 part to 4 or 5 of normal saline solution instilled into the nares so that it comes in contact with the swollen pharyngeal tissue. If the structures of the pharynx and tonsils are reddened and swollen, so that there is blocking of the outlets of the eustachian tubes, an incision is advisable. An incision of the drum is not, however, the whole treatment, as in addition to irrigations of the external auditory canal local application to the pharynx and tonsils of argyrol or a similar preparation are necessary.

Although a patient cannot be protected against mastoid disease associated with a general systemic infection, it is possible to give some drainage through the external meatus.

Many nervous children get relief by local heat, and instillations of warm boric acid solution into the ear.

In the writer's experience, patients who have relief only when chloroform vapor is blown into the ear require incision. Smears after incision showed streptococcus, pneumococcus, of different types, Friedlander's bacillus, staphylococcus and catarrhalis.

Re-incision may be required if a primary incision has not been free enough for drainage, and when infection and swelling of the soft tissue of the eustachian canal block the way to the pharynx. Re-incision is indicated particularly when there is sagging of the wall of the external auditory canal, even if no other symptoms are present. Re-incision must be made if a tympanum shows the same condition that necessitated the primary operation, that is, pain, bulging and temperature.

Finally, there are cases where mastoid symptoms are present when the otologist and pediatrician will have to decide whether a re-incision of the tympanum should be done or the mastoid cells exenterated.

R. N. ANDREWS.

**REMOVAL OF ADENOIDS IN INFANCY:** Dr. Tod (The Practitioner, London, November, 1920). (Arch. of Ped., April, 1921.) The author states that when removing adenoids under the age of 6 months, especially if the baby be undersized, or ill-developed, a general anesthetic is neither required nor advisable. The infant is held in a sitting position by a nurse, a small curette is passed up behind the soft palate into the postnasal space and brought down with one sweep. Owing to the small size of the space, it requires but a tiny pad of adenoids to give rise to symptoms. As a rule, very little bleeding takes place, and there is little shock if the infant is kept warm. It is advisable not to feed for 3 hours before the operation.

The author has removed adenoids on infants as young as 3 weeks, and has observed no harmful results. On the contrary, immediate benefits were noted, and infants became stronger and better. He urges that adenoids be removed, no matter how young the infant, whenever they give rise to symptoms which may affect its immediate or future welfare.

R. N. ANDREWS.

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## ROENTGENOLOGY

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### SUPERVISORS:

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R. G. ALLISON,  
SYNDICATE BLDG., MINNEAPOLIS

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**ROENTGEN RAY INTOXICATION—III:** A study of Renal Function in Roentgen Ray Intoxication. Resistance of Renal Epithelium to Direct Radiation. Irvin McQuarrie, and G. H. Whipple. (Jour. of Exp. Med., Feb., 1922, p. 213.)

This paper deals with renal function and changes following exposures to Roentgen rays. Normal adult dogs, which had been observed for several days previous to the

experiment, and whose urine had previously been examined, were used in these experiments. A hard Coolidge tube was used, with 2 mm. aluminum as filter, and exposures of 25 cm. distance. Approximately 8 milliamperes were used in almost all experiments, the range being 5 to 10 milliamperes and 90 kilovolts, backed by a 9-inch spark gap. Exposures varied greatly, from lethal dose at a single exposure to moderate sublethal doses, over a period of time, with rest periods between exposures. Also, different regions of the body were exposed separately in different experiments. Renal function was studied by means of phenolsulphonephthalein test and urea elimination. Blood urea was determined at the same time.

Three groups of experiments were performed.

**Group I.** Group of sublethal exposures at intervals over a long period of time.

In this group there is no evidence of any cumulative effect of x-ray exposure, regardless of the amount of exposure given. Tabular results of four experiments are given in this group.

**Group II.** Group of lethal exposures over the abdomen with the kidneys and the rest of the body shielded.

In this group it was desired to study whether or not any toxic materials produced by radiation of the abdomen were carried to the kidney by the blood stream and there evidenced toxicity. Regardless of the severe intoxication and death in dogs of this group, there was no evidence of altered kidney function. While blood urea was increased to a degree, the urea ratio remained the same. In this group there was no evidence of the presence in the blood of nephrotoxic substances, even during severe intoxication. There are three tabular experimental reports for this group.

**Group III.** Group of enormous exposures of the kidneys, the remainder of the thorax and abdomen being shielded.

In this group of experiments there is a moderate depression of kidney function and a corresponding drop in the urea ratio, both probably due to the direct action of Roentgen rays on the kidney substance. There are six tabular experimental reports.

In all cases, histologically, nothing could be demonstrated; the kidneys of the radiated dogs were undistinguishable from those of the unirradiated.

From their work, the authors conclude that there is no danger of nephritis or kidney changes following x-ray exposure, and that the renal epithelium is more resistant to Roentgen rays than is that of the small intestine.

A. U. DESJARDINS.

**ROENTGEN RAY INTOXICATION:** Speed of Autolysis of Various Body Tissues of the Lethal X-ray Exposures: S. L. Warren and G. H. Whipple. (Jour. of Exp. Med., Feb., 1922, p. 225.)

By a simple method of autolysis very interesting information has been obtained regarding the rate of autolysis of different tissues of radiated and unirradiated dogs.

It was found in the radiated dogs that the rapidity of autolysis of the epithelium of the crypts of the small intestine was greatly increased, while in the same dog the epithelium of the villi was definitely slower in autolysis. However, in unirradiated dogs the epithelium of the villi

was autolysed first, while that of the crypts last. This was found to be constant at all stages up to death of the animal.

The lymphatic tissue, pancreas and liver of radiated dogs showed a slight increase in rate of autolysis, but in the stomach, colon and kidney there was little or no change.

After exposing the dogs to the action of Roentgen rays they were sacrificed by anesthesia at the end of 2, 24, 48, 72, and 96 hours. Sections were taken from various organs and fixed in 10 per cent formaldehyde, while other sections, approximately 3-5 gm. in weight, were taken from organs and placed, while warm, in bottles of warm 0.9 per cent sodium chloride previously saturated with excess of chloroform. These were then incubated at 37° C. and sections were cut at 4, 8, 10, 12, and 24 hour periods and fixed in 10 per cent formaldehyde. For controls, by a like procedure, autolysis was carried out in bottles prepared as above, except without chloroform, but with variable results, as in this instance putrefactive bacteria made inroads enough to obscure the true results. Further controls of organs of three unirradiated dogs were carried out under identical conditions.

This paper is illustrated with charts and tables of the various experiments performed.

A. U. DESJARDINS.

**ROENTGEN RAY INTOXICATION—I: Unit Dose Over Thorax Negative. Over Abdomen Lethal. Epithelium of Small Intestine Sensitive to X-rays.** S. L. Warren and G. H. Whipple. (Jour. of Exp. Med., Feb., 1922, p. 187.)

This paper reports a series of investigations concerning the systemic intoxication developing after certain exposures to large doses of hard Roentgen rays. X-ray reaction

is believed to be a true "non-specific intoxication," which is due to "primary injury of the epithelium of the small intestine," inasmuch as certain exposures over the thorax of a dog, whose abdomen was shielded, gave no apparent clinical manifestations, while the same exposure over the abdomen of the same dog, the thorax being shielded, produced a fatal intoxication.

Post-mortem examination revealed numerous areas of necrosis and atrophy with extensive disappearance of the epithelium of the villi and crypts in the small intestine, from the pylorus to the ileocecal junction, while the inflammatory reaction was not at all in proportion to the damage of the intestinal mucosa.

Radiation of the thorax, even in large amounts (300-512 milliamperes minutes) failed to produce clinical symptoms, only a slight temporary leukopenia and slight increase of the total nitrogen excretion being noted.

Radiation of the abdomen, with a unit thorax exposure, gave typical clinical manifestations, after a latent period of 24-36 hours; diarrhea, vomiting, weakness, prostration and death, usually occurred in four days. Inasmuch as there is more bone-marrow and lymphatic tissue involved in the radiation of the thorax than in that of the abdomen, and because the Peyer's patches of the small intestine gave evidence of very little change after radiation while the epithelium covering these follicles was either atrophied or absent, it was concluded that neither the bone-marrow nor the lymphatic tissue was responsible for the reaction following x-ray exposures.

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## ROSTER CORRECTIONS

In compiling the roster, printed in the May number of Minnesota Medicine, several errors were made. Correction of the mistakes, to which attention has been called, appear herewith. If there are any other members whose names were misspelled or whose address was wrongly given, they will confer a favor by advising, so that the official roster may be as accurate as it is possible to make it.

**Goodhue County Medical Society**  
President  
Alva Conley, M.D., Cannon Falls  
(omitted from original roster)

**Wabasha County Medical Society**  
Secretary  
W. F. Wilson, M.D., Lake City  
(omitted from original roster)

**Le Sueur County Medical Society**  
L. F. Woodworth, M.D.,  
.....Le Sueur Center  
(erroneously printed in the original roster as L. F. Wentworth.)  
**St. Louis County Medical Society**  
L. M. Morsman, M.D., Hibbing  
(erroneously printed in the original roster as C. F. Morsman.)

### ALPHABETICAL ROSTER

The following members were omitted from the official roster as published in the May number of Minnesota Medicine.

J. D. Boyd, .....Caledonia  
C. B. Eby, .....Spring Valley  
A. N. Gunz, .....Center City  
J. P. Freeman, .....Glenville

R. F. Nannestad, .....Lanesboro  
Chas. F. Nootnagle, .....Minneapolis  
H. P. Sawyer, .....Goodhue  
M. W. Smith, .....Red Wing

### ALPHABETICAL ROSTER

The following names of members were misspelled in the original roster as published in the May number of Minnesota Medicine.

Aylmer, A. L., .....Minneapolis  
Archibald, F. M., .....Mahnomon  
Baker, Glen L., .....Austin  
Bolles, D. W., .....Galveston, Texas  
Bass, Geo. W., .....Minneapolis  
Busman, G. J., .....Rochester  
Benepe, L. M., .....St. Paul  
Benolt, Frank T., .....Minneapolis  
Borreson, B., .....Bemidji  
Bouman, H. A., .....Minneapolis  
Bowling, H. J., .....Rochester  
Carlaw, C. M., .....Minneapolis  
Clark, C. H., .....Galup, New Mexico  
Cosman, E. O., .....Minneapolis  
Crume, Geo. P., .....Minneapolis  
Darrow, Daniel C., .....Moorhead  
Eisenman, W. G., .....Chisholm  
Ellison, Frank G., .....Monticello  
Folken, Frank G., .....Albert Lea  
Frisch, Frank P., .....Gibbon  
Gilbert, J. D., .....Carlton  
Golberg, M. L., .....Jasper  
Heath, A. C., .....St. Paul  
Helland, G. M., .....Spring Grove  
Hemstead, Werner, .....St. Cloud  
Hertel, G. E., .....Austin  
Hitchings, W. S., .....Lakefield  
Hoidale, A. D., .....Tracy  
Holcomb, J. T., .....St. Paul  
House, Z. E., .....Cass Lake  
Hielscher, Julian A., .....Mankato

Hursh, M. M., .....Grand Rapids  
Joyce, T. M., .....Janesville  
Kesting, Herman, .....St. Paul  
Kelling, Louis F., .....Lakefield  
Knauff, M. K., .....St. Paul  
Knickerbocker, Frank H., .....Staples  
Lewis, C. B., .....St. Cloud  
Leibold, H. H., .....Parkers Prairie  
Lillie, H. I., .....Rochester  
Lynch, Matthew J., .....Minneapolis  
McKibbin, Harry E., .....St. Cloud  
Maland, Clarence O., .....Minneapolis  
Maguire, Leo, .....Minneapolis  
Mark, D. B., .....Minneapolis  
Myers, Thos., .....St. Paul  
Morss, C. R., .....Zumbrota  
Nelson, C. P., .....Owatonna  
Osburn, Burt E., .....Internat'l Falls  
Pelant, F. J., .....New Ulm  
Phelps, A. G., .....Ogilvie  
Pierce, Chas. H., .....Wadena  
Pineo, W. E., .....Minneapolis  
Putney, Geo. E., .....Paynesville  
Ransom, M. L., .....Hancock  
Read, Chas. A., .....Minneapolis  
Reeves, C. E., .....Eagle Bend  
Roberts, W. B., .....Minneapolis  
Rowntree, L. G., .....Rochester  
H. P. Sawyer, .....Goodhue  
Scott, John W., .....St. Charles  
Shannon, Wm. Ray, .....St. Paul  
Shelden, W. D., .....St. Paul  
Strachauer, A. C., .....Minneapolis  
Theissen, W. N., .....Faribault  
Thomas, G. J., .....Minneapolis  
Warham, T. T., .....Minneapolis  
Willius, Frederick A., .....Rochester

It is suggested that this page be torn out and placed with the original Roster as published in the May issue of this Journal.